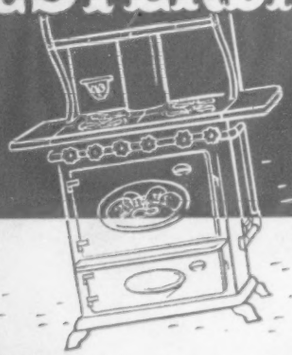
Western
C
V. 16

GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

YESTERDAY'S PERFORMANCE WON'T DO
in Pressure Regulators either



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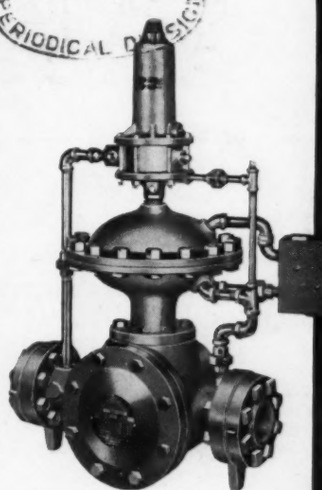
PERIODICAL DIVISION

TODAY'S modern gas ranges have largely supplanted the old, wasteful, inefficient gas cookers of a few years ago. The development of modern gas burning equipment has given a tremendous impetus to the greater utilization of gas. But, back of the scenes, in the transmission and distribution departments of gas companies, many necessary changes are taking place daily—old, outmoded equipment is being rapidly replaced in order to keep abreast of increased loads with their imperative demands for constant pressure despite fluctuating volume.

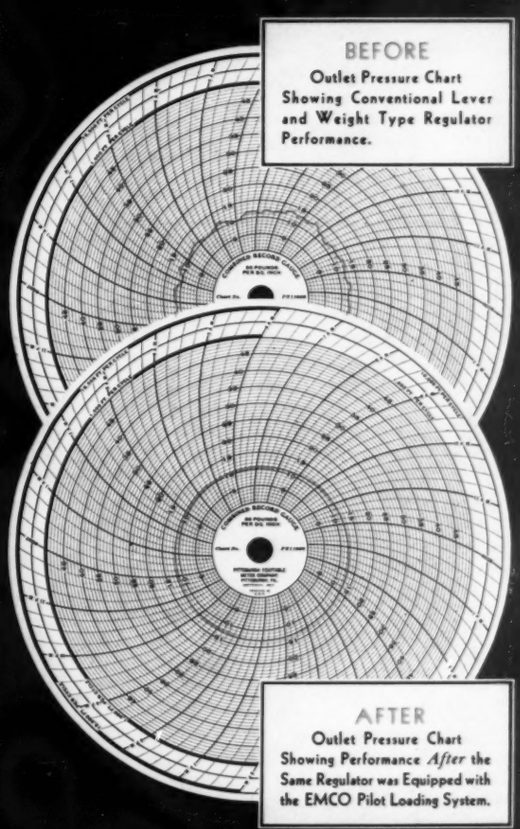
An important aid to the gas engineer in solving his pressure control problems is the new EMCO Type 39 Pilot Loading System. This System, used with EMCO High Pressure Balanced Valve Regulators, in place of conventional lever and weight loading, provides improved performance, greater flexibility, higher accuracy and increased sensitivity in pressure regulation. It is designed to provide the highest degree of control accuracy for outlet pressures of from 2 to 300 pounds. The EMCO Pilot Loading System can be applied to any existing EMCO High Pressure Balanced Valve Regulator.

Bulletin 1055 completely describes the applications and shows, with four color diagrams, the operating principles. Write for your copy today.



EMCO High Pressure Balanced Valve Regulator Equipped with Pilot Loading System, Type 39.

COMPARE REGULATOR PERFORMANCE



BEFORE
Outlet Pressure Chart Showing Conventional Lever and Weight Type Regulator Performance.

AFTER
Outlet Pressure Chart Showing Performance *After* the Same Regulator was Equipped with the EMCO Pilot Loading System.

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MERCO NORDSTROM VALVE CO.
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FOR APPLICATION TO EMCO HIGH PRESSURE BALANCED VALVE REGULATORS

EMCO Pilot Loading System

JULY 1940 ◆ ◆ 25 CENTS

Prevents Leaks

Throughout engineering practise, the stuffing-box principle is used where a movable part (as in a pipe joint) enters a pressure chamber. On this principle are based all mechanical joints made by members of this Association. Mechanical joint cast iron pipe is an economical material for high pressure distribution mains—long-lived, low in maintenance cost, easily assembled.

Look for the "Q-Check" registered trade mark. Cast iron pipe is made in diameters from 1¼ to 84 inches.

THE CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1013 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS

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THE STANDARD MATERIAL FOR UNDERGROUND MAINS

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WAC 9/9/41

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Pacific Gas & Electric Company is proud of its record for uninterrupted service . . . and uses Cooper-Bessemer compressor units to help maintain that record! The rugged, slow-speed units shown above are Type 19's, pushing gas to "P. G. & E." users with minimum maintenance and low operating costs.

Type 19's boast notable records in many of the country's big main-line stations . . . records for great Reliability, unexcelled Longevity, and utmost Economy. Write for details of Cooper-Bessemer 25 to 1500 hp compressor units.

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GAS

REG. U. S. PATENT OFFICE

Sixteenth Year of Publication

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U.S. cast iron PIPE

Dayton BOLTLESS FITTINGS

Pioneered by Dayton, this line of Boltless Fittings has a broad field of application in relieving strains on mains at service connections—as an aid in eliminating leaks in localities where heavy frosts are a hazard, and where operating conditions demand flexibility.

TEAR ON THIS LINE AND FILE FOR FUTURE

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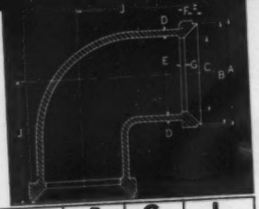
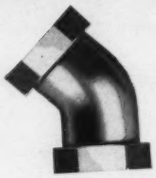
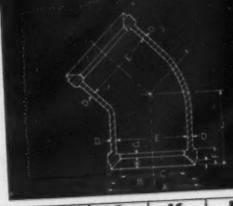


I.D.	A	B	C	D	E	F	G	J
1¼	2.437	2.312	1.750	.125	1.937	.437	.125	2.500
1½	2.750	2.625	2.000	.125	2.125	.500	.125	2.750
2	3.437	3.312	2.469	.156	2.625	.500	.125	3.250

No. 20 BOLTLESS TYPE ELBOWS—45°

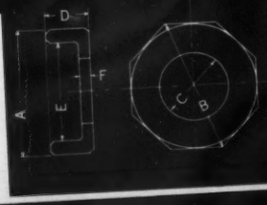




I.D.	A	B	C	D	E	F	G	K	J
1¼	2.437	2.312	1.750	.125	1.937	.437	.125	.281	2.00
1½	2.750	2.625	2.000	.125	2.125	.500	.125	.312	2.00
2	3.437	3.312	2.469	.156	2.625	.500	.125	.422	2.50

FLANGES FOR DAYTON BOLTLESS FITTINGS

I.D.	A	B	C	D	E	F
½	2.000	2.165	.906	.750	1.469	.187
¾	2.125	2.300	1.125	.750	1.687	.187
1	2.375	2.570	1.437	.750	1.937	.187
1¼	2.750	2.975	1.750	.750	2.313	.187
1½	3.063	3.313	2.000	.875	2.625	.250
2	3.875	4.194	2.469	.875	3.313	.250



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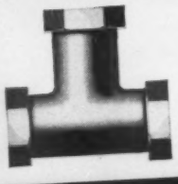
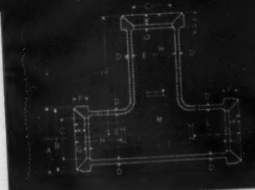
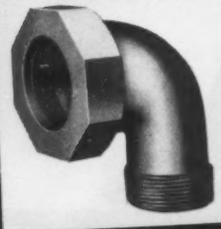


I.D.	A	B	C	D	E	F	G	H	I	J	K	M
1	2.062	1.937	1.437	.125	1.562	.437	.125	1.50	4.250	3.75	.250	5.00
1¼	2.437	2.312	1.750	.125	1.937	.437	.125	1.50	4.188	3.75	.281	5.00
1½	2.750	2.625	2.000	.125	2.125	.500	.125	1.50	4.125	3.75	.312	5.00
2	3.437	3.312	2.469	.156	2.625	.500	.125	2.25	5.404	4.00	.422	6.50



No. 18 COMBINATION SERVICE ELBOWS—90°



I.D.	A	B	C	D	E	F	G	H	J	K	P	R	S
¾	1.812	1.687	1.125	.125	1.312	.437	.125	2.50	3.00	.250	.125	1.062	.812
1	2.062	1.937	1.437	.125	1.562	.437	.125	2.50	3.00	.250	.125	1.313	1.062
1¼	2.437	2.312	1.750	.125	1.937	.437	.125	3.00	3.00	.281	.125	1.660	1.250
1½	2.750	2.625	2.000	.125	2.125	.500	.125	2.50	3.00	.312	.125	1.906	1.656
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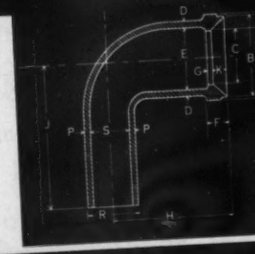
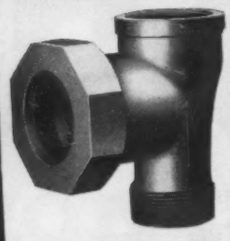
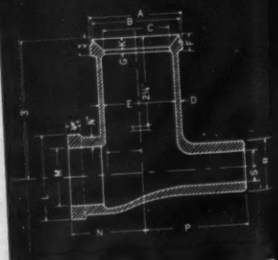


No. 17 COMBINATION SERVICE TEES



A	B	C	D	E	F	G	PIPE SIZES Female	PIPE SIZES Male	PIPE SIZES Boltless	K	L	M	N	P	R	S
2.750	2.625	2.000	.125	2.125	.500	.125	1	1½	1½	.312	2.062	1.156	1.940	2.690	1.900	1.468
2.437	2.312	1.750	.125	1.937	.437	.125	1¼	1	1¼	.281	2.203	1.515	1.940	2.690	1.315	.844
2.750	2.625	2.000	.125	2.125	.500	.125	1½	1	1½	.312	2.437	1.750	1.940	2.690	1.315	.844
2.750	2.625	2.000	.125	2.125	.500	.125	1½	1¼	1½	.312	2.437	1.750	1.940	2.690	1.660	1.250
2.750	2.625	2.000	.125	2.125	.500	.125	1½	1½	1½	.312	2.437	1.750	1.940	2.690	1.900	1.468
2.750	2.625	2.000	.125	2.125	.500	.125	2	1¼	2	.422	2.937	2.219	2.500	3.125	1.660	1.250
3.437	3.312	2.469	.156	2.625	.500	.125	1¼	1¼	1¼	.281	2.203	1.515	1.940	2.690	1.660	1.250
2.437	2.312	1.750	.125	1.937	.437	.125										



THE NATIONAL SUPPLY COMPANY

DAYTON COUPLING DIVISION

GRANT BLDG., PITTSBURGH, PA.

Why not Investigate . . .

This Low-Cost Method of Reducing Unaccounted-for Gas Loss

"Carboseal" anti-leak is now being used by over 250 gas companies for reducing leakage in packed bell-and-spigot joints in systems distributing dry gases. Hundreds of reports received from these companies confirm the effectiveness and permanence of "Carboseal" anti-leak treatment. The costs summarized in the table at the right have been taken from these reports. They include both material and labor costs and are typical of general field experience.

How "Carboseal" Anti-Leak Works

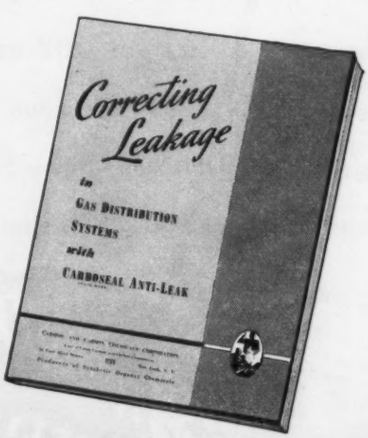
When dry gas is substituted for wet gas, the water and oil in the joints evaporate, the packing is dehydrated and shrinks, and leakage results where the lead or cement caulking has loosened due to expansion or contraction.

"Carboseal" anti-leak swells the packing and keeps it wet indefinitely. This scientifically developed liquid is introduced into the mains at the high points and flows over the joints by gravity to the drips where the surplus is recovered for re-use. It can also be sprayed into the mains by means of a hose. Both of these methods are used without interrupting gas service, and without making expensive joint excavations.

Diameter of Main	*Length of Main, Feet*	*Method of Treatment*	*Actual Cost Based on 3-in. Equivalent Main*	
			Dollars per Mile	*Cents per Joint**
3 in. equiv.	181,632	Gravity	145	29
4 in.	1,200	"	113	23
4 in.	11,900	"	135	27
3 in. equiv.	43,800	"	180	36
3 in. equiv.	544,525	"	383	77
4 in.	2,332	"	135	27
4 in.	22,200	Hose	331	66
4 in.	26,250	"	279	56
6 in.	5,576	"	237	47
4 in.	154,954	"	440	88
6 in.	16,400	"	318	64
10 in.	4,925	"	230	46
12 in.	2,000	"	184	37
16 in.	1,200	"	173	35
4 in.	203,404	"	407	81
6 in.	23,976	"	293	59

*Based on 500 joints per mile.

Get a Copy of this New Book!



It will pay you to send for a copy of this book which contains in compact form all the essential facts about "Carboseal" anti-leak, the methods of application, comparative costs, and results obtained. Possibly this inexpensive and economical method of correcting joint leakage can be used to advantage in your system. A request on your company letterhead will bring you the book, without obligation.

CARBIDE AND CARBON CHEMICALS CORPORATION

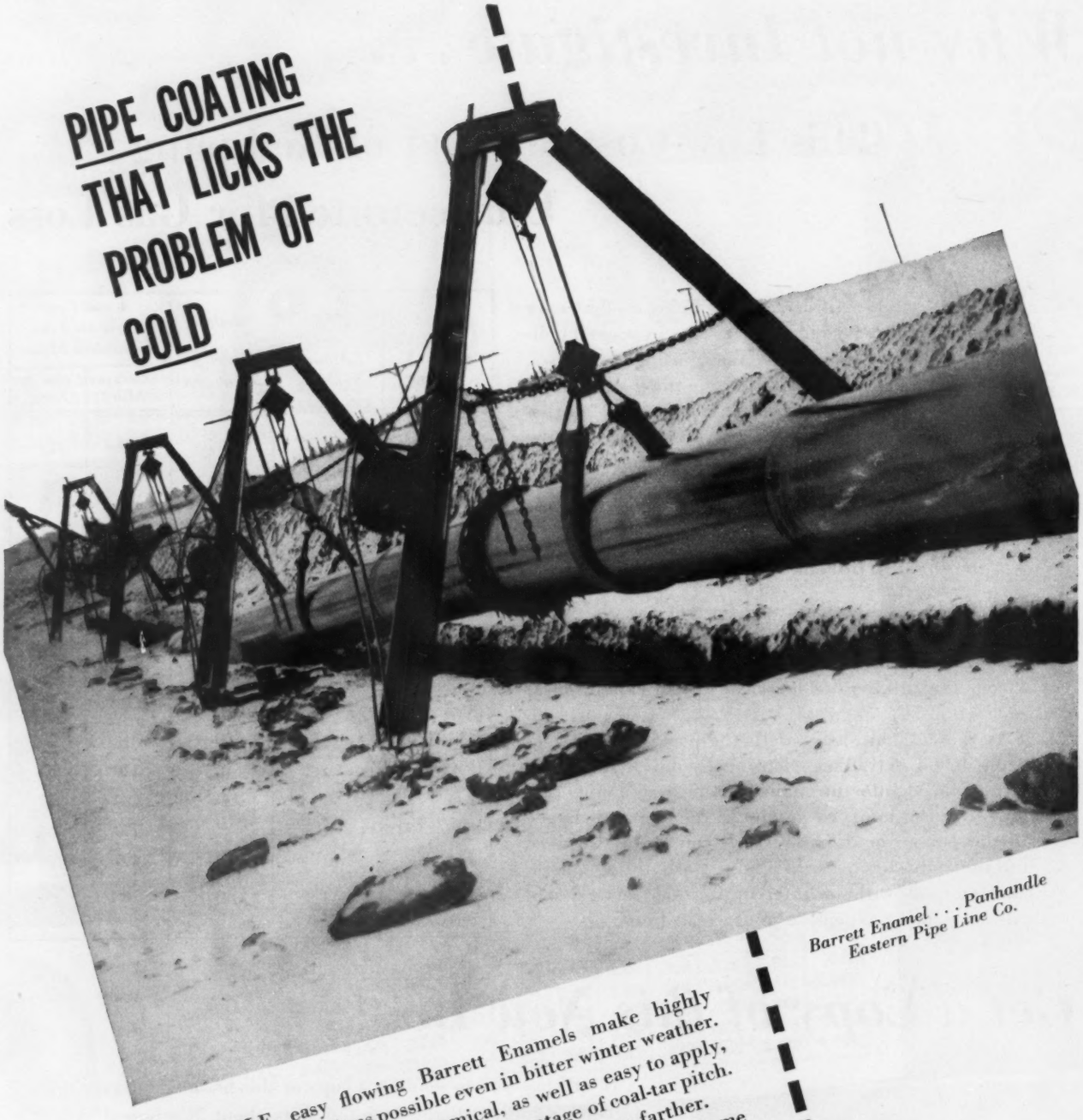
Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York, N. Y.

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

The word "Carboseal" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.

PIPE COATING THAT LICKS THE PROBLEM OF COLD



Barrett Enamel . . . Panhandle Eastern Pipe Line Co.

FLEXIBLE, easy flowing Barrett Enamels make highly efficient installations possible even in bitter winter weather. And Barrett Enamels are economical, as well as easy to apply, because of the use of an optimum percentage of coal-tar pitch. To a given coating thickness, Barrett Enamel goes farther. In service these Barrett products resist the rigors of extreme temperatures and the stresses of line currents and soil acids. Barrett manufacturing skill assures high uniform quality, and the expert assistance and inspection by Barrett-trained field men assure the right amount of the right kind of protection—when you specify Barrett.

THE BARRETT COMPANY

40 RECTOR STREET NEW YORK, N. Y.

FIELD SERVICE—To help engineers achieve the best possible results with the use of Barrett Enamels, we maintain a Pipe Line Service Department and staff of Field Service men. You can count on them for practical assistance on technical and in-the-field problems. Inquiries invited.

Barrett PIPELINE ENAMEL

When YOU say service, you probably have some vague definition of the term in mind. But when WE say service, we mean delivery of equipment from strategically located warehouse stocks or emergency delivery from branch and distributor stocks in all important cities in the United States and Canada as well as foreign countries. All are staffed by factory trained representatives, who are available to you at all times.

MINNEAPOLIS-HONEYWELL

Minneapolis-Honeywell Regulator Company, 2946 Fourth Ave. S., Minneapolis, Minn. Canadian Plant: Toronto, Ontario. European Plant: London, England. Company owned branches in 49 other cities.

Control Systems

THE MYSTERY* OF THE FLUTTERING DISC

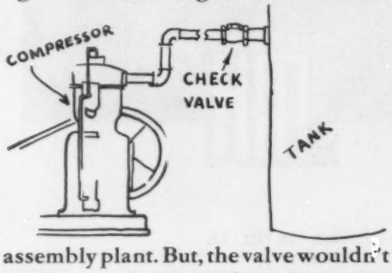
SOLVED WITH PREVENTIVE MAINTENANCE

"Why in blazes," asked the SUPER., "does that air compressor run all the time for a part-time job?"

"For the love of Mike," said the P. A. "This is the fourth time we've replaced that air line valve."

"This looks like a case for Preventive Maintenance," said the CRANE REPRESENTATIVE. "And Crane can supply the check valve you really need."

THIS conversation between the Superintendent, the P. A. and the Crane man isn't on record, but the facts are: The installation was a simple one as the sketch here shows: a common swing check valve in an air line, between compressor and storage tank—in a regional automobile



assembly plant. But, the valve wouldn't hold tight—it required much too frequent replacement. And in the meantime, the compressor panted along, doing twice the work it needed to —for those swing checks started leaking long before they actually gave up the ghost.

Ordinary maintenance would have again replaced like with like. But the Superintendent saw that Preventive Maintenance—as suggested by W. F. W., the Crane salesman, was necessary. It counseled stopping the trouble at the source: eliminating a valve in which the disc could flutter itself to pieces in the pulsating flow of air from the compressor, replacing not with another swing check valve, but with a cushioned disc check valve.

Results: (1) No further replacements even after five years, (2) a tight valve that holds air, keeps the compressor inactive except when service uses demand air, (3) one more manufacturer who has learned the economy of Preventive Maintenance and of looking to the Crane line for just the right valve for the job —of looking to the Crane salesman for the information needed for correct valve application.

* *This case is based on an actual experience of a Crane Representative in our Chicago branch.*

PREVENTIVE MAINTENANCE COUNSELS

Crane Cushioned Disc Check Valves

In any service—steam, water, air, oil or gas, where pulsation is severe, these Crane piston disc check valves will absorb the damaging effects of the flow. A dashpot formed above the piston effectively cushions the disc with each pulsation. For pressures up to 300 pounds steam at 550°, your best bet is this Crane 366E with both body and disc of Crane Hard Metal —a copper-tin bronze of high wear-resisting quality. Can be reground without removing body from line. In sizes up to 3"—with screwed or flanged ends. See page 36 of your Crane No. 52 Catalog.

1940 OUR 85th YEAR

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Do You Know

THE ODORANT CONCENTRATION OF THE GAS YOU DISTRIBUTE?

PENTALARM *and the* PENTALARM COLORIMETER

REMOVE ALL DOUBT AND UNCERTAINTY!

Regardless of the method of introducing PENTALARM into your pipelines, it's imperative TO KNOW DEFINITELY that the gas HAS BEEN ODORIZED EXACTLY AS YOU WANT IT TO BE. The superintendent may say, "It smells pretty strong to me." The foreman may retort, "I don't get it at all!", while a third operator may ask, "Is it strong enough?"

Such differences and doubt are removed when PENTALARM AND the newly developed PENTALARM COLORIMETER are used in gas odorization. Not only does this compact, portable Colorimeter measure the odorant concentration IN THE GAS quickly and accurately, but it gives a permanent, indisputable record for future reference and use.

★ *ILLUSTRATED BOOKLET MAILED ON REQUEST* ★

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THE SHARPLES SOLVENTS CORP.

PHILADELPHIA CHICAGO NEW YORK

A *New* DEVELOPMENT IN ODORIZATION CONTROL

Universal Presents

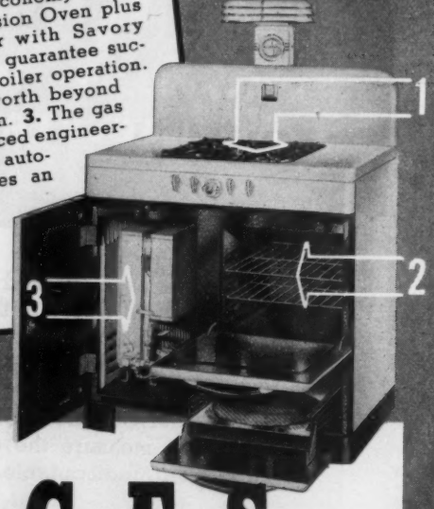
THE *BEACON* UNIVERSAL

A Range that gives a new and higher standard of cooking Performance plus *Automatic* GAS KITCHEN HEATING . . .

★ The new Beacon Universal is a range expressly designed and engineered for the gas utility industry. From the standpoint of cooking performance, it renders a service that is absolute "tops" in all divisions of cookery. It incorporates advanced devices that interpret gas fuel in the best possible light—guaranteeing the utmost in cooking perfection plus a new order of convenience, economy and added use value.

In addition, the Beacon offers a complete automatic gas kitchen heating service. It embodies a gas heating unit of proved and recognized excellence that assures high efficiency, economical gas consumption and a relatively wide heating radius...Thus the Beacon caters to the most vital interests of the gas utility—cooking and heating—and in both divisions of service it presents a new and higher standard of modern, automatic performance.

1. Simmer-Save Burners with automatic controlled boiling heat bring a new flexibility, a new convenience, a new economy to top-of-range cooking. **2.** Precision Oven plus the In-A-Drawer Broiler with Savory Smoke-Proof Broiler Grid, guarantee success in every oven and broiler operation. They have proved their worth beyond any possibility of question. **3.** The gas kitchen heater is of advanced engineering design. It embodies automatic safeguards. It gives an automatic heating service of proved efficiency and economy.



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GAS (cp) RANGES ★

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GAS
JULY, 1940

GUEST Editorial

He Also Serves . . .

By ARTHUR F. BRIDGE

Vice President and General Manager
Southern Counties Gas Company
Los Angeles, California

A REQUEST for this guest editorial comes at a moment of great uneasiness. As I write, France appears to have succumbed to overwhelming odds and given up the struggle against totalitarian aggression. The British Empire faces what promises to be the most critical period in her history. The United States, aroused by what has happened to other liberal countries, has started a costly program of preparedness and defense. Unquestionably we are confronted with a grave menace to our economy and perhaps to our national life. The implications in the present world situation are clear enough so far as we are concerned. We must mobilize our resources and mobilize them quickly. The dangers that threaten can scarcely be exaggerated.

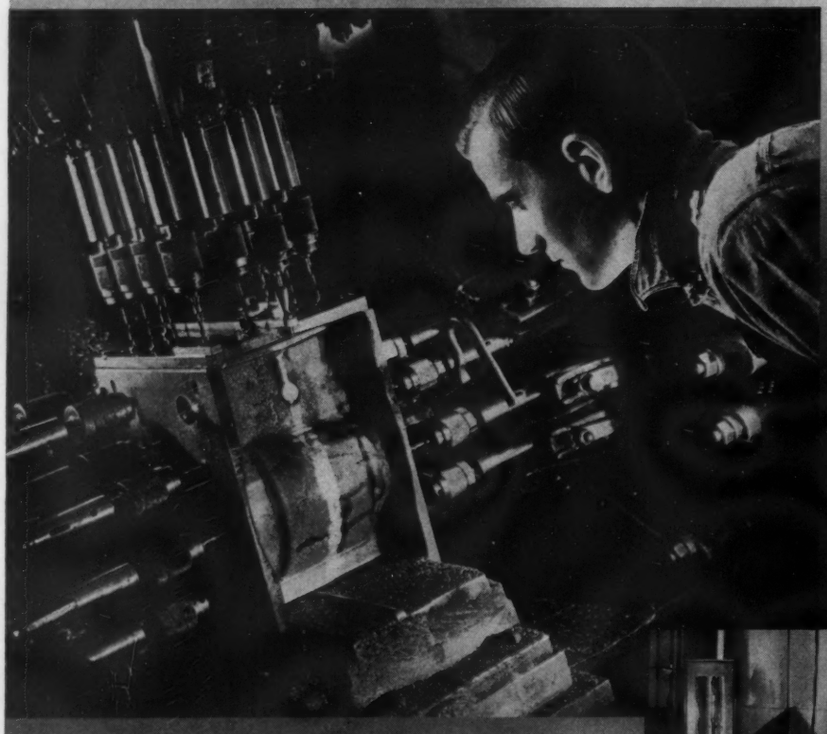
Yet we cannot afford the luxury of panic or hysteria. Everyone should do his part without hesitation or reservations; but soberly and thoughtfully. The gas industry, through Walter C. Beckjord, president of the American Gas Association, has pledged full cooperation in plans for national defense; and that for the moment is all we as an industry can do. It is all we as individuals can do, as well. There are these significant passages in the reply Louis Johnson, assistant secretary of war, made to the gas industry's proffer:

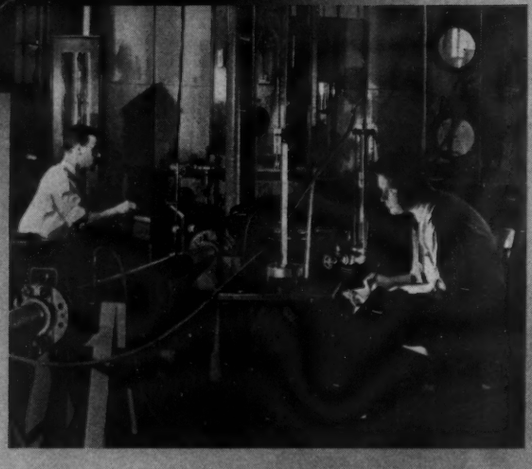
"I am fully aware of the vital role your industry may play in the industrial preparedness of our nation. The steps you have outlined in your letter for developing plans to maintain uninterrupted service, including the protection of your properties, are an assurance of your loyal contribution to the general program.

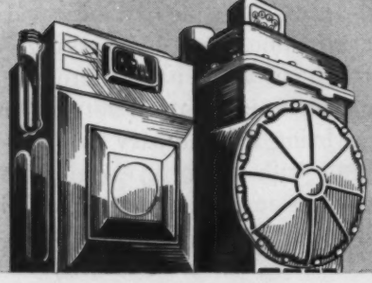
"In the listing of facilities for emergency production every effort is made to utilize experience and competence to the best advantage and to maintain, as far as practicable, usual peacetime relationships and practices. Our plans seek to reduce to a minimum the need for diverting important industries such as yours from their normal products."

Should it be necessary to labor the point? Our job seems to be clearly indicated. We can best serve the common cause by carrying on as usual, without excitement and without heroics. If we can continue normal, uninterrupted service under all conditions, and bring the industry through the troubled times ahead with as little impairment of its plants and facilities and personnel as possible, we will have fulfilled our duty.

Laboratory controlled ... precision built







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AMERICAN METER COMPANY

INCORPORATED (ESTABLISHED 1836)

1320

THERMALLY *thinking*

Shining Example

In an address before the American Management Council, reprinted in the *Readers Digest* for June, William Hard, a well-known writer on economics and business topics, points to the Testing Laboratory work of the A.G.A. as an outstanding example of industry voluntarily testing and setting standards for its products that afford a genuine protection for the consumer.

The major portion of his paper, entitled "We Get Together—or Else," is frankly critical of the failure of American business to grasp the implications of the economic changes that are in progress. Demanding a new and closer unity among all economic groups, he urges that business instead of abdicating to government, should itself lead the way.

Praise of this kind is doubly valuable, not only for its effect on the attitudes of the millions who receive the *Readers Digest*, but because it encourages the industry itself to continue those efforts that have placed it securely in the ranks of progressive and enlightened institutions.

How's About It?

Our contention that the Gas Industry could do without some of the conventions, conferences, clambakes and charivaris that dot its convivial calendar has stirred up an increasing response from members of the industry, both utilities and equipment manufacturers.

Ninety per cent of the letters received have endorsed our recommendations that the entire convention technique of the industry is due for a good overhauling. Many of the writers request that their names be withheld, for the very good reason that no one wants to stick his neck out for the ax of reprisals.

> "We have read with interest and approval your editorials regarding conventions . . . Every manufacturer and many gas men feel the same way . . . we have naturally refrained from making any public statement about it because . . . each manufacturer feels that if he does not in open meeting . . . support the promoters of meetings . . . he will be considered as not in sympathy with the business. The manufacturers are especially plagued with the number of meetings."

That is from one of the biggest manufacturers in the appliance and equipment group, and one, incidentally, whose open-handed hospitality at meetings has been exploited unmercifully more than once.

> "Having been urging the reduction in the total number of meetings . . . for the past several years, I am in hearty accord with your editorial, 'Too Many Meetings.'"

We quote in the above a utility executive who regards with growing concern the increasing demands on the time of his employes that the indiscriminate calls to conference entail.

> "Your editorial in regard to conventions in general is timely. The question is very serious and, as far as I know, all executives are of one mind in regard to the matter of simplifying the present situation."

The executive who regards the question as very serious sums up the expressions of many others who have volunteered like opinions.

The report of the Policy Committee of the Association of Gas Appliance and Equipment Manufacturers is a matter of public record, and as such we are violating no confidence when we reprint this excerpt which was endorsed by the association's Board of Directors:

> "The chairman also referred to an editorial, copy attached to these minutes, which appeared in the May, 1940, issue of *GAS* concerning the suggestion that there are now too many meetings being held within the gas industry. He felt that this subject was of economic importance to manufacturers, especially in view of the trend of the increasing number of such meetings being held from year to year.
>
> "The committee recommended that this matter be called to the attention of the Board and every effort be made through the proper media to curtail the number of such meetings. The chairman suggested that each manufacturer on request of the publishers of the magazine, *GAS*, could well express his opinion freely as being in sympathy with the purpose of the editorial."

Will voluntary action on the part of gas associations remedy this evil? Will a protective boycott have to be organized by those of like mind who are tired of extravagant and uneconomic demands that are made of their time and their finances?

For the moment we are content to pose the question. How's about it?

Commercial Refrigeration Is Ready

In the three and one-half years since the first commercial gas refrigerating unit was publicly displayed before a gas convention, a lot of water and a lot of words have gone under the bridge; but a lot of experimentation and development have been accomplished, too. It is now safe to say that as far as the product is concerned, it is ready for incorporation into a real sales program by the industry. Over 400 commercial installations of the remote cooling type have been made by gas companies across the entire United States, and they have been made under conditions permitting observation, study,

and improvement under scores of conditions.

George S. Jones, vice president and general sales manager of Servel, Inc., in a straightforward address to the Industrial Gas Section, A.G.A., at its Hotel, Restaurant and Commercial Sales Conference in Atlanta, laid the issue of commercial refrigeration sales squarely before the executives of the gas utilities. The product is ready, in I.M.E. capacity up to 1000 lbs. The market is vast, in this, and the various intermediary sizes, electrical compressor type units sold last year totaled over 100,000 installations.

The next step lies with the gas companies themselves. Do they want the load? Considering the fact that his company has invested nearly $500,000 in commercial refrigeration over and above income from the sale of units, the recommendations of Mr. Jones are remarkable in their restraint. He urges only that each utility investigate its own peculiar conditions as regards rates, competition, and the desirability of this type of business, and then decide on the basis of cold facts what it wants to do about it.

Since Servel, Inc., exists as a practical monopoly in the manufacture of gas-fired refrigeration equipment, its relation to the industry is more than that of the general run of gas appliance manufacturer. It is in effect the source of supply for all of the equipment concerned in one of the "four big jobs" that the industry would have assigned to gas.

Servel, quite properly, asks that the industry carry on in a field on which Servel has already expended substantial sums in development. Quite properly it asks the utilities to study their rate scales as they apply to commercial refrigeration, to determine at what minimum price this load would meet competition and still remain attractive. The industry, on the other hand, may quite properly remind the sole manufacturer of this important type of equipment, that the cost of initial installation is often the deciding factor in making or losing a sale. Competition must be met on all fronts—half a Maginot line proved to be as valueless as none at all.

Central Heating

Studying the A.G.A. statistical information covering the first quarter of this year, we stumbled across something which strikes us as being particularly significant. We wonder how many were similarly impressed.

In the manufactured gas industry, domestic heating revenue for February topped the combined industrial and commercial revenue. This is the first time this has ever happened in the long history of the manufactured gas industry. Granted it was only by about $10,000, but we wonder how many manufactured gas men 10 years ago ever thought they'd live to see the day when home-heating would make such a noteworthy showing in the monthly statement.

We know it was about as mean a winter as we are likely to meet, and that February was a snorter. But, when 19.2% of our total revenue in any month can definitely be chalked up to home-heating, the ever-widening gap between our original gas lighting status and our capacity in the domestic fuel field can be better appreciated—and evaluated.

The Committee on National Defense

It is a matter of profound pride and satisfaction to observe the alacrity with which our industry has moved in placing its experience and facilities at the disposal of the War Department and all other departments of the United States Government concerned with national defense.

That this is to be no mere lip service, voiced at a moment when patriotic protestations have become the accepted order of the day, is seen by President Beckjord's immediate move in appointing from the membership of the American Gas Association a new Committee on National Defense. Headed by George F. Mitchell, this is the most powerful group ever assembled from utility ranks. It includes men from every section of the country who are not only the most competent to make decisions, but who are in a position to implement these decisions through their authority to issue orders that will not be subject to equivocation or delay.

This is the type of leadership that every industry and every interest in American life needs at this climaxing period in our national existence. It is the type of leadership that can be implicitly relied on to prepare for any emergency that may arise, and yet to rise above the hysterical counsel of those who would rush out to meet death in preference to remaining at home that we might preserve life.

The Gas Industry has demonstrated in the past, and will demonstrate again if the occasion arises, its ability to rise to heroic heights at the Nation's call. Trinitrotoluol—picric acid—lyddite—sulphate of ammonia are terms that ring with a strange and forbidding familiarity on our ears. Yet in a world where force must be met with force, it is a guarantee of our very security to know that the gas that heats our homes and contributes in innumerable ways to the comforts and the satisfactions of life can also yield the indispensable basic materials on which the preservation of that life may depend.

Monumental tasks of planning, coordination, development and construction may lie ahead for the Committee on National Defense. But there still rests on the shoulders of every member of the industry the continuing responsibility to see to it that the peacetime gains so honestly won are not lost by sheer default. As laymen that is our greatest possible contribution to the defense of Democracy. And it is a contribution made greater by the realization that it makes Democracy worth defending.

A United Gas Industry Mobilizes

FOR THE NATIONAL DEFENSE

THE nation's manufactured and natural gas industry, through the executive board of the American Gas Association, has placed its services and its support at the disposal of the departments of the Government concerned with national defense. The offer of the industry was made in a letter to Assistant Secretary of War Louis Johnson jointly from Walter C. Beckjord, president, and Alexander Forward, managing director, of the Association.

In their letter to Assistant Secretary Johnson, Messrs. Beckjord and Forward stated: "We shall proceed to develop plans to maintain so far as possible uninterrupted service to industry, our customers and the public in every period of emergency and hostilities and will put such plans into effect at any time it may be desirable and necessary.

"The gas industry has already demonstrated its facilities for assisting in the production of munitions of war, as by-products in the manufacture of coal gas such as trinitrotoluol, lyddite, benzol, sulphate of ammonia, drugs, and antiseptics. Natural gas in addition to its availability and necessity as a fuel and power in almost every manufacturing process is a valuable chemical source of war materials.

"The gas industry has also in its ranks men with broad experience gained in the World War or subsequently in various branches of the service in the manufacture of munitions, chemical warfare, the gas and flame service, ordnance and aviation."

An outline of a four-point program whereby the gas industry could assist in national defense follows:

1. The immediate development of plans to provide uninterrupted service to its customers, to industry and to the public, in every period of emergency and hostilities.
2. The immediate development of adequate measures for the protection of manufactured gas plants and property, and for long distance natural gas transmission lines, and a simultaneous development of a plan for segregated gas supplied areas in the case of attack on towns and cities.
3. Complete cooperation of the industry for assisting in the production of war munitions. The industry has already demonstrated its facilities for producing such by-products in the manufacture of coal gas as: trinitrotoluol, lyddite, benzol, sulphate of ammonia, drugs and antiseptics. Natural gas, vital not only as a fuel and a source of power, is itself a valuable chemical source of war materials.
4. Complete cooperation from the industry's personnel who, during the World War, gained valuable experience in the manufacture of munitions, chemical warfare, gas and flame service, aviation and ordnance.

In a reply to Mr. Beckjord's letter, Louis Johnson, Assistant Secretary of War, expressed his appreciation of the gas industry's offer of cooperation:

> "I am fully aware of the vital role your industry may play in the industrial preparedness of our nation. The steps you have outlined in your letter for developing plans to maintain uninterrupted service, including the protection of your properties, are an assurance of your loyal contribution to the general program.
>
> "In the listing of facilities for emergency production every effort is made to utilize experience and competence to the best advantage and to maintain, as far as practicable, usual peacetime relationships and practices. Our plans seek to reduce to a minimum the need for diverting important industries, such as yours, from their normal products.
>
> "It is believed that in any emergency the gas industry would contribute vital support to the common effort by carrying on uninterrupted service to industry to a maximum degree."

Another reply was received by Mr. Beckjord from Robert L. Ghormley, Rear Admiral of the United States Navy and Acting Chief of Naval Operations, which stated:

> "The patriotic interest of your industry in preparedness is appreciated. The great importance in the munitions programs of the materials and services such as produced by facilities in your association is fully recognized. Your letter has been made a matter of record for such further consideration as developments may warrant."

W. C. BECKJORD

A. FORWARD

American Gas Association executives offer the industry's services for national defense.

Secretary of the Interior Harold L. Ickes wrote Mr. Beckjord as follows:

> "The gas industry has been very helpful to the Government during past emergencies and its assistance will be needed to cope with the many problems that the Government is facing in the immediate future.
>
> "In the Department of the Interior the Bureau of Mines is concerned with some of the plans mentioned in your letter. The bureau cooperates with the Army, Navy, and other federal agencies in technologic and economic investigations pertaining to fuels and the mineral industries.
>
> "One of the immediate requirements for national defense is the maximum recovery of benzol and toluol, used in the manufacture of explosives, from coal gas and carbureted water gas manufacturing operations. Under ordinary conditions much of the benzol and toluol produced in city gas plants is not recovered as such but is allowed to remain in the gas distributed to the consumer. It appears that your association might cooperate in encouraging the installation of by-product recovery plants wherever significant quantities of benzol and toluol might be obtained.
>
> "As an immediate step it is suggested that you confer with Dr. R. R. Sayers, acting director of the Bureau of Mines, regarding measures that may be taken to direct the cooperative investigations now in progress toward preparation of the gas industry to meet possible emergencies. I am confident that by continuation of the cordial cooperation of the American Gas Association with the Department of the Interior, problems of mutual interest that may arise can be solved quickly and effectively."

On June 20 a Committee on National Defense, under the chairmanship of George F. Mitchell, president of The Peoples Gas Light and Coke Co. of Chicago, was announced, with its first meeting scheduled for June 28, at A. G. A. headquarters in New York City. The personnel of the committee consists of men of practical experience in every phase of gas manufacture, transmission, distribution and utilization from every section of the United States.

As an aid to the advancement of the Association's program, the publishers of *GAS* have gathered statements from industry leaders who have pledged their support to the Association's efforts in behalf of national defense. These statements follow:

E. F. Schmidt, vice president, Lone Star Gas Co., Dallas, Texas: "Most natural gas properties operated today performing continuous efficient service are necessarily well prepared for many of the emergencies of war. Well-organized and experienced repair crews are strategically located over these far-flung systems, ready at a moment's notice, day or night, to cope with destruction caused by floods, wind and fire. In the event of threatened invasion, these crews would be strengthened and enlarged to more speedily make repairs.

N. T. SELLMAN
Contacts both federal and local authorities.

E. F. SCHMIDT
His company can furnish helium.

"During the first World War, the Lone Star organization assisted our Government in the manufacture of helium and became quite conscious of the exigencies of war in connection with natural gas properties. This was the only helium made during the war and experience gained during these operations was the basis for the Government's helium plant constructed and operated at Amarillo. We are ready to help again.

"Huge quantities of butane contained in most natural gases are currently being used for fuel. This could be extracted and polymerized for high octane aviation fuel. In lesser amounts, iso-butane is available for manufacture of more efficient aviation fuel.

"Our company stands by ready to serve large quantities of natural gas for industrial purposes in connection with war industries, just as we are now serving peace industries. We have an efficient organization ready to help."

• • •

P. S. Young, chairman of the executive committee, Public Service Electric and Gas Co., Newark, N. J. "We propose to give full support and cooperation to every effort to advance the national defense program insofar as this company is concerned."

• • •

James B. Black, president, Pacific Gas and Electric Co., San Francisco, Calif.: "This company is in complete accord with the four-point program which President W. C. Beckjord and Managing Director Alexander Forward of the American Gas Association outlined in their May 28th letter to Assistant Secretary of War Louis Johnson. Our position as to these four points is as follows:

1. Surveying our facilities, we believe we are now in position to provide uninterrupted service to our customers in virtually any period of emergency. However, we are checking our gas system carefully in every particular, sources of supply, transmission and distribution. If any weakness is discovered which might interfere with continuity of this service in a period of crisis, we shall take every step humanly possible to correct it.

2. Every precaution will be taken to safeguard our gas system. Our own patrol staff and watchmen, trained to their work, will be urged to even greater vigilance. Additionally, we shall ask the peace officers of the territory we serve to give such aid as they can in policing and protecting the properties.

3. The manufacture of munitions is one of the essential steps in a national defense program. We stand ready to cooperate in every possible way, just as we did in the World War, when by-products of our gas manufacturing plants were turned over to the Government in huge quantities. At present we are operating only a few small gas manufacturing plants, with limited output of by-products. Such help as they can give is at the Government's disposal. Our system serves chiefly natural gas, which is used largely in mixture with other elements to build up chemicals indispensable in munitions manufacture. We are prepared to make natural gas available to munitions plants to the limit of our system's capacity.

4. The personnel of our organization stands ready to serve. It includes many men who served during the World War, with virtually every branch of the service represented. Many of these men hold commissions in the National Guard and in army and navy reserve units. By reason of the nature of our business, they are men who have had technical training, among them being engineers, chemists, aviators, students of ordnance, and particularly students of gas and flame and other types of chemical offense and defense and of modern mechanized warfare. The advisory service of these trained men, whose interest in national defense through many years, testifies to their patriotism, is immediately available to Government defense.

F. H. ADAMS
Heat treating furnaces will be needed.

J. B. BLACK
Our personnel stands ready to serve.

In subscribing to this four-point program, which is an individual company pledge of cooperation, I wish to add a word of commendation to the American Gas Association for its prompt offer of the industry's assistance.

• • •

F. S. Wade, president, Southern California Gas Co., Los Angeles, Calif.: "I can only say that our company will cooperate in every possible way with our National Government in the development of our own defense program.

F. S. WADE
Our properties will be protected.

C. N. LAUER
Whatever is necessary will be done.

We have not at this time any specific plans, but we are working on a program to protect our property and to provide continuous service in the event of any national emergency. We are, of course, in accord with the four-point program started by officials of the American Gas Association."

• • •

N. T. Sellman, assistant vice president, Consolidated Edison Co. of New York, Inc.: "I can assure you that this company is in contact with both Federal and local authorities as preliminary to any special services we may render in connection with developments in the national defense program."

• • •

Conrad N. Lauer, president, The Philadelphia Gas Works Co., Philadelphia, Pa.: "Whatever it is necessary for this company to do to meet the requirements of the present conditions, or any emergency which arises, will be done."

• • •

F. H. Adams, vice president and general manager, Surface Combustion Corp., Toledo, Ohio: "We are in hearty accord with the four-point program, as outlined by Messrs. Beckjord and Forward, for gas industry cooperation in the national defense program. Practically all of the physical equipment for munitions and armament involves some form of heat treating, a field in which this company has specialized for more than thirty years. We are cooperating closely with those organizations with whom the Government will place munitions contracts."

MODERNIZING

A Bakery with Gas

By BERNARD F. REIMERS

Industrial gas engineer, Public Service Electric and Gas Co., Newark, N. J.

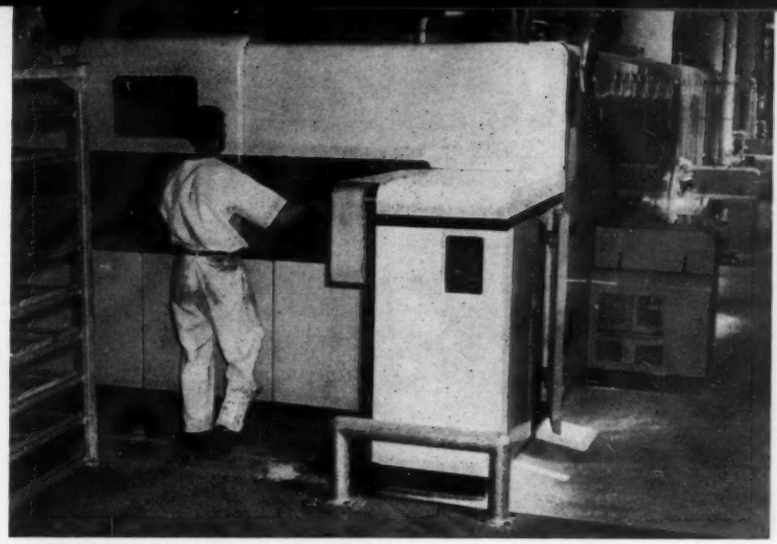


FIG. 1. Charging end of the 120-ft. diathermic gas oven, showing automatic gas burner and control equipment in four zones along the right side.

A BAKERY modernization job that started 10 years ago, when the Continental Baking Co., in its Paterson plant, replaced five of its 10 old-fashioned oil-fired peel ovens with two gas-fired traveling hearth ovens, has now been completed, for the five oil-fired ovens that remained have now been replaced by a new 120-ft. oven of the latest design, which is also fired by gas.

The Continental Baking Co., makers of "Wonderbread," have been among the foremost bakers in the industry in their constant attention to plant modernization, and with the completion of the present new oven job, the Paterson plant is now serving Northern New Jersey with bread from the "sunniest bakery in New Jersey."

The new layout was developed around the central idea of creating a bake shop which would provide a maximum of light, ventilation and personal comfort for employes. For this reason the shop was brought from its former location on the first floor to the second floor. The new construction is of concrete with glass-brick wall panels and casement windows. Ventilation is so designed that the air currents pass from the working areas toward the ovens, thus sparing employes any consciousness of oven heat. New locker rooms, wash rooms and lunch room facilities have also been provided, together with roomy, modern salesmen's quarters. Stressing scrupulous cleanliness in the bakery, Continental pays particular attention to the condition of its bake shop floors, which are of matched maple and are kept polished until they reflect the whiteness of all the equipment.

The basic element in the new set-up is a 120-ft. Baker Perkins diathermatic traveling-hearth oven, fired by manufactured city gas in four individually controlled zones along its length. The oven is heavily insulated to minimize heat transmission and effectively streamlined or "clean lined." The four furnaces of the oven are under the hearth instead of over or alongside of the baking space as was formerly the practice. This is a feature which not only helps in the conservation of waste heat, but also makes the use of gas as the fuel even more desirable.

In addition to the new oven, two direct-fired traveling-tray ovens have been brought up to the new bake shop from their previous locations, and have been completely modernized. An outstanding feature of this modernization was the installation of a Balistat atmospheric valve on each oven, which maintains a balance of pressure within the baking chamber and prevents oven gases from blowing toward the oven operator. In this manner baking fuel is conserved and more comfortable operating conditions are made possible.

Since the new traveling oven has been in operation it has averaged between ¾ and 1 cu. ft. of gas per pound of dough. It uses about 3000 cu. ft. per hour of 525 B.t.u. gas while heating up and cuts down to around 60% of that consumption when hot. The capacity of the oven is about 2800 loaves per hour. Oven temperatures are thermostatically controlled and the thermostats may be independently set for any desired temperature in each of the four sections or zones. Hearth speed, of course, is also adjustable. Injected steam at 1¾ lbs. conditions the oven atmosphere as may be required.

Fig. 1 is a view of the charging end of the oven, showing the automatic gas burner and control equipment, in four zones along the right side. Fig. 2 shows details of the control and burner equipment for zone No. 2. Fig 3 shows the discharge end of the oven, where the bread is dumped onto a conveyor belt.

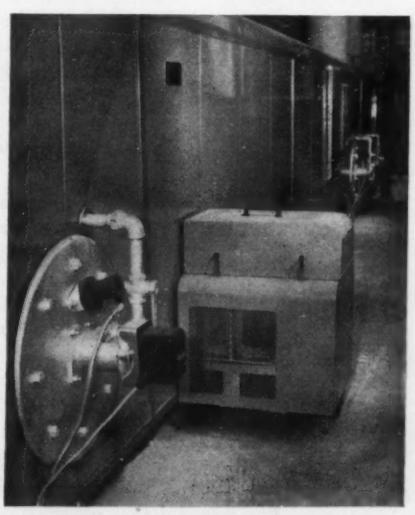


FIG. 2. Control and burner equipment for zone No. 2 of gas oven.

FIG. 3. Discharge end of oven, where bread is dumped on a conveyor-belt.

BREAKING GAS

By MURRAY WYCHE

In the main kitchen of the newly modernized Erlanger Hospital, gas is used for both light and heavy duty cooking. Gas bake ovens and roasters have recently been installed by the Chattanooga Gas Co. O. F. Reynolds (insert), the company's sales supervisor, is largely responsible for an aggressive campaign which has resulted in record sales of gas appliances and commercial gas in Chattanooga, where cheap TVA electric power is being distributed in competition.

IN the heart of the Tennessee Valley, where the government - sponsored Tennessee Valley Authority is conducting its broad experiment in cheaper and more abundant electric power, the Chattanooga Gas Co. last year broke all existing records in the sale of commercial gas and gas appliances, both domestic and commercial.

In the face of electric power rates slashed 20% in the City of Chattanooga, in competition with aggressive appliance-selling campaigns by Chattanooga dealers, confronted with extensive newspaper advertising staged by the Chattanooga Electric Power Board in attempts to boost its power lead, the Chattanooga Gas Co. was able to report a gain of 19% in the sale of gas appliances for the year and an increase of 30% in commercial gas sales.

It was with no undue hysteria or extra budgetary expense by the gas company that these gains were accomplished. They came as the results of steady and intelligent activity by live-wire salesmen, themselves sold on gas superiority, who went out and convinced Chattanooga housewives and business and industrial consumers that "gas is the best fuel."

It was on August 15, 1939, that the City of Chattanooga, in co-operation with the Tennessee Valley Authority, purchased the generating and transmission facilities of the Tennessee Power Co. and began the distribution of cheap TVA power in the city.

The Chattanooga Electric Power Board was immediately organized to direct the city's power affairs. Announcing that it would not enter the appliance business, the board however set up a department to co-operate with the city's electric appliance dealers in boosting appliance sales. A large downtown showroom was turned over to dealers to display their electric appliances. The Power Board announced it would install free all electric ranges and water heaters sold by the local dealers. It also mapped plans for an extensive and continuous advertising campaign boosting electric appliances in general and otherwise aiding dealers in all ways possible. Before the change-over the electric utility, seeking to discourage the coming of TVA power, had slashed its rates from 10% to 20% in some instances.

High "Powered" Competition

Undaunted and undismayed, the Chattanooga Gas Co. of which A. J. Goss is president, set out in the face of this high "powered" competition, continuing to sell gas appliances, and setting new records each month. Under the direction of O. F. Reynolds, general sales supervisor, and C. N. Mallory, assistant, and with R. S. Kinzalow in charge of commercial sales, practically each month of the past 12 has shown an increase over the corresponding month of the preceding year.

During 1939, the gas company exceeded its quota on water-heaters by 56%. The company is now selling approximately 300 automatic water heaters a year, which is near the saturation point for Chattanooga.

Last year the company exceeded its gas refrigerator quota, selling 31% more Electrolux refrigerators than in the preceding year. Although the number of gas ranges showed no increase over the preceding year, Mr. Reynolds points out that the dollar volume was up around 10%, and that the number of outright sales was substantially more.

In Chattanooga, where cheap coal is plentiful, but results in a terrible smoke pall over the city, more gas space heaters are being sold than ever before, Mr. Reynolds said, with indications pointing to even greater sales in this clean, smokeless fuel as Chattanooga wages an intensive smoke-abatement campaign. Fireplace heaters increased in 1939 a total of 34% over the preceding year and the gain in smaller domestic appliances was in proportion.

Checking his appliance sales for 1939 and the months of 1940, Mr. Reynolds has noted a trend towards the completely automatic in gas ranges. "Our customers," he said, "want automatic lighting on their ranges and the same is true, only more so, in water heaters with the automatic preferred to the manual operated type, one hundred to one.

"In Chattanooga we have also found of late a trend towards larger refrigerators. We are selling more six-ft. refrigerators. Customers, too, are demanding the deluxe features for their

PRINT IN BINDING

SALES RECORDS IN TVA'S STRONGHOLD

refrigerators. One who buys a five-foot box, for instance, will put the difference in deluxe gadgets."

Commercial gas installations have kept pace with the popularity of domestic gas appliances, Mr. Kinzalow reports. All of Chattanooga's leading hospitals now are using gas for cooking, gas being selected for the kitchen of the newly modernized Erlanger Hospital, Chattanooga's largest institution. All leading Chattanooga hotels use gas for cooking, it was stated.

For the success of gas appliance sales in Chattanooga, bouquets can be pinned on Mr. Reynolds and Mr. Mallory and the live-wire salesmen developed by them. Believing that the "laborer is worthy of his hire," the Chattanooga Gas Co. maintains its mark-ups on ranges, refrigerators, water heaters and other appliances, making up the difference in liberal commissions and large bonuses to its salesmen.

A Contest a Month

Contests are arranged for each month in which salesmen can substantially increase their earnings for the period. And these are not dull and ordinary contests that grow tiresome and drag. They are new, clever and interesting, contests into which the salesman can enter with the zest of play with a handsome prize of cash or merchandise as his reward.

The total cash bonuses and prizes available to appliance salesmen of the Company for the month of May was $1200, all in addition to regular commissions and allowances.

"We try to arrange something different every month," said Mr. Mallory, "something that will keep the boys interested. Among our sales force the spirit of competition is high and every man is on his toes."

Convinced that "you can't give somebody the measles until you've got them yourself," the company has developed a group of salesmen who have not the slightest doubt that "nothing can compete with gas as a fuel." The rest has been easy.

Last year seven monthly contests were staged. This year 10 have been planned, each one different from the other and each novel and interesting.

For the month of June a great "Gas Merchandising Derby" was run at the gas company with interest reaching a fever pitch hardly less than at Louisville's famous classic.

During this contest each salesman was a jockey in the great "Gas Merchandising Derby." On each appliance sold a value was placed of from 25 cents up, and for each sale the cash equivalent was put in the purse.

A huge board was erected and for every 50 cents made available for the purse by a salesman, the salesman-jockey and his horse was advanced one space on the board. Pari-mutuel betting was arranged with the head of the office as bookmaker. Odds were figured each day on the standing of the horses and salesmen and members of the office force could bet on their favorites by buying tickets up to 50 cents. The race was run in three heats and every member of the organization took part.

The betting money also went into the pot and at the end of the month the horse and jockey having covered the greatest distance, as marked by sale of the most appliances during the month, was declared the winner. The money in the purse was divided equally between the winning jockey and holders of winning pari-mutuel tickets.

By the end of the month, it was found, the purse had attained really worth-while proportions, and the interest in the race was hardly less at the finish time than when post-time arrives at Churchill Downs.

Appliance sales for June promise to be the company's biggest month.

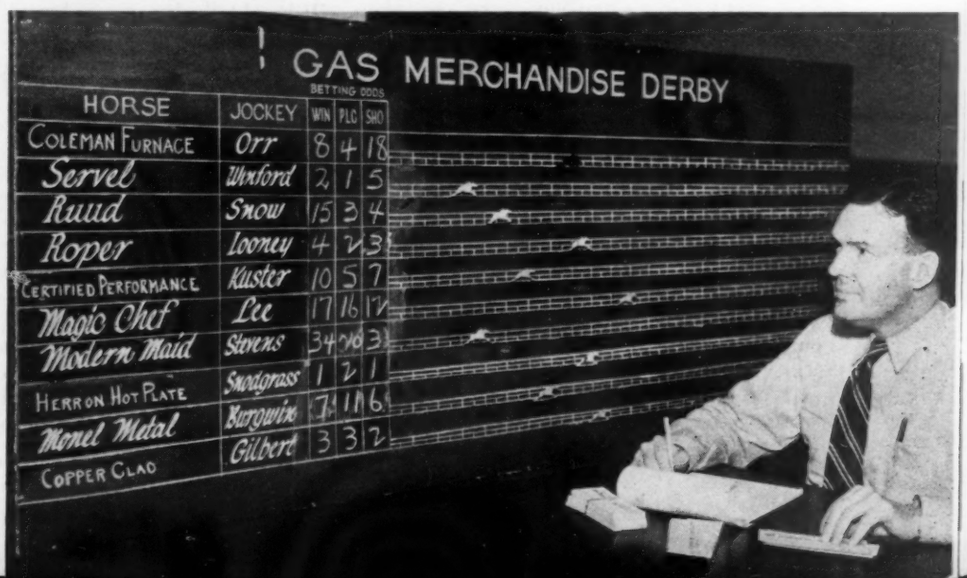
Another popular contest was the "Dress Up Campaign" for May in which gas company salesmen had an opportunity to win a total of $1200 in cash prizes and merchandise. For the contest a quota of three new refrigerators, eight new ranges, ten new automatic water heaters with two used or two rental appliances to count as a new one, was set up for each man.

On the wall was a set of cards showing each man behind a question mark. As he sold a unit, the representative emerged from behind the question mark clad only in a barrel.

Thereafter unit sales produced the following results: Second unit, one pair of garters; third unit, one pair of socks; fourth and fifth units get representatives out of barrel and give him a pair of shorts and an undershirt, and so on until the fourteenth and fifteenth units provide a coat and vest; the sixteenth through the twenty-fifth units bring cash awards, with the twenty-sixth unit being a grand prize of a 17-jewel gold watch.

Still another contest was the "On The Warpath" contest which proved popular in encouraging salesmen to go out and sell gas appliances. The sales

Raymond Wallace, credit supervisor of the Chattanooga Gas Co., figured the odds for the company's "Gas Merchandising Derby" campaign. Gains of the salesmen-jockies were posted each day on the board, and pari-mutuel betting was arranged. For each appliance sold, the company put an amount of money in a purse, which was divided at the end of the campaign between the winning salesman and the holder of the winning pari-mutuel ticket.



force was divided into two tribes lead by Chief "Go-Get-'Em" and Chief "Up-And-At-'Em" who directed their respective tribes in the pursuit and capture of enemy scalps.

A cash bounty of 25 cents for meters (new customers) to $3.00 for eight-ft. and larger refrigerators was fixed with each appliance representing a different type scalp. Scalps ran from the "hairless" variety to the "red-haired long" for the large refrigerators.

Part of the wampum was divided among the winning tribe every 10 days and part put in a pot to be divided at the end of the month among the winners. This contest also created plenty of interest and resulted in a nice increase in appliance sales for the month.

Each representative of the Chattanooga Gas Co. is exclusively responsible to the customer for everything including service. If a trouble order comes in, a copy goes to the salesman who immediately follows through to see that the customer is again satisfied. "The salesman is the company so far as the company is concerned, and he is directly responsible for the goodwill and satisfaction of the public," it was explained by Mr. Reynolds.

Gas company salesmen in Chattanooga, within the past several years, have faced the stiffest competition from electric appliance salesmen of perhaps any city in the nation. Yet they continue to tell a story of "better results and superior service" and to tell it convincingly, as indicated by the records they have set.

To meet the argument of "cheaper electric rates," Chattanooga Gas Co. salesmen have only to point out that the use of two major gas appliances will bring the same low rate as does electricity. If it is solely a matter of cooking, they point out the advantage of the modern gas range, which they argue, will do all and more than the electric range.

Gas refrigerators are being sold in Chattanooga on the basis of being the most modern on the market with no moving parts, no maintenance cost, no noise and no replacement. It's an argument that's hard to rebut.

"The Public Be Pleased" is the motto of The Chattanooga Gas Co. And in living up to it to the fullest extent, they have maintained, and increased, the use of gas in Chattanooga.

East Ohio Gas Co. to Build Plant for Storing Natural Gas in Liquid State

THE East Ohio Gas Co., Cleveland, will begin immediate construction of a $1,000,000 liquid gas plant and storage tanks, it has been announced by C. E. Gallagher, president. The purpose of the new plant, which is said to be the first of its kind in the world, is to create a storage system to insure Cleveland's industrial and domestic consumers an adequate supply of gas during winter months.

The plans for the liquid gas plant involve the construction of three spherical, 57-ft. diameter storage tanks, into which will be stored 250,000 cu. ft. of liquid gas, which is equal to 150,000,000 cu. ft. of natural gas. Under the process outlined, the gas will first be compressed under 600 lbs. pressure and then liquefied by cooling it to a temperature of 250° F. below zero. The tanks will be supplied by Republic Steel Corp. and will be made from special nickel steel and insulated with cork.

The plant itself, which will be 145 ft. long and 26 ft. wide, will house the compressors, pumps, and other apparatus, including steam boilers developing 1000 hp. It will be erected by the Gas Machinery Co.

After being pumped into the plant through the company's regular lines, the gas will be compressed and liquefied through the cooling process, which involves boiling by ethylene and ammonia. Restoration of the liquid to its natural gaseous state for use by consumers will be accomplished by the use of steam applied around the pipes through which the liquid flows from the tank, it has been revealed by official reports.

According to Mr. Gallagher, the plant will be able to liquefy and store the gas at the rate of 4,000,000 cu. ft. every 24 hours, but the vaporization process can take place at the rate of 3,000,000 cu. ft. per hour, or 72,000,000 cu. ft. a day.

The Cleveland company's plan for storing liquid gas to take care of peak load demands was evolved after it was found that its maximum daily supply of 200,000,000 cu. ft. coming from Ohio and West Virginia fields was inadequate in emergencies. Because of the fire hazard and the tremendous space required, it was considered impractical to store the gas in its natural state. It was estimated that in order to store 150,000,000 cu. ft. of gas in its vapor form, about 30 huge tanks and acres of ground would be necessary.

In its liquid form, the equivalent of 150,000,000 cu. ft. of gas will be stored in 1/600th of the space required for natural gas. In consistency the liquid gas will be similar to water, and because it is under no pressure when stored, the fire and explosion hazard will be eliminated.

A summary of the East Ohio company's plans for the storage of gas was carried in *Time* Magazine in the issue of June 24, 1940.

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Southern Natural Co. Begins Huge Expansion Program

A 170-hp. compressor station has recently been completed at Barnesville, Ga., by the Southern Natural Gas Co., Birmingham, Ala., as part of its $3,000,000 1940 expansion program, it has been reported by R. H. Ulrich, vice president. The compressor is a Cooper-Bessemer Type 80 unit, and was installed at the junction of the Macon branch line and the line serving Barnesville and Thomaston, Ga.

The company recently placed an order with the Cooper-Bessemer Corp. for 19 gas-driven compressor units having a total of 13,510 hp. These units are to be installed at Perryville, La.; Onward, Pickens, and Louisville, Miss.; Tarrant and Selma, Ala., and Ben Hill, Ga. The present idle station at DeArmanville, Ala., is being rehabilitated, and new stations are proposed for serving Meridian, Miss., and Chattanooga, Tenn.

Two new construction offices have been established by Southern Natural, one at Monroe, La., where C. C. Whittlesey is in charge of station construction, and the other at Birmingham, Ala., where N. R. McKay is in charge of the construction of stations. Chief Engineer R. H. Burdick has general supervision of both offices.

The company is now considering the expansion of this construction program to cover the installation of loop lines paralleling parts of existing main and branch transmission lines.

■ ■

Lake Crystal, Minn., Grants Natural Gas Franchise

The Minnesota Valley Natural Gas Co., Mankato, Minn., was recently granted a 25-year natural gas franchise by Lake Crystal, Minn. However, the city may not be piped until next year, it was reported by A. W. Scofield, new business manager.

The same company is now serving Shakopee, Minn., which is completely piped with approximately 3200 ft. of distribution system. Natural gas service was begun June 3, and it is expected there will be 400 meters in this town. The natural gas is obtained from the line of the Northern Natural Gas Co., now extending to Minneapolis.

■ ■

Pittsburgh Company Plans To Build 117-Mile Line

A new 117-mile, 8-in. pipe line will soon be constructed from Olean, N. Y., to Brookville, Pa., by the Manufacturers Light & Heat Co., Pittsburgh, Pa. They will also build 12 miles of 8-in. line between Monaca and Ellwood City, Pa., north of Pittsburgh.

Flexibility of Appliances

Operating On Natural and Substitute Gases

ALL gas appliances approved by the American Gas Association have the ability to perform satisfactorily on all types of city gases distributed in the United States and Canada, provided they are properly adjusted on the particular gas with which they are supplied. In all cases the term "properly adjusted" implies that the gas input rate is regulated to the correct value as specified by the manufacturer of the appliance and that air shutters, if supplied, are adjusted so that primary air injection is such as to produce satisfactory flame characteristics. Certain appliances are designed to use different burners for manufactured and natural gases, and in such cases proper adjustment on a given gas requires use of the correct burner. Other appliances are capable of accommodating with suitable regulation of input rate and primary air entrainment gases varying from 530 B.t.u. manufactured gases to 3200 B.t.u. butane gas without modification except orifice and air shutter adjustments. It may be stated, therefore, that gas appliances possess an extraordinary flexibility to perform satisfactorily on different types of fuel gases both by virtue of their inherent design and the ready means of adjusting to specified conditions of gas supply which are incorporated in their construction.

A different aspect of flexibility of gas appliances is their ability to accommodate variations in composition of gas without readjustment of orifices or air shutters. Under such conditions of utilization, whatever changes in input rate, primary air injection, and burning characteristics that may be brought about by changes in gas composition must be accommodated by the appliance with the original gas rate and primary air adjustment which may have been made. Unless otherwise specifically stated, the term "flexibility" as used in this study refers to this latter condition of operation. In summary:

1. Flexibility of typical gas appliances is such that composition of natural gas can be varied over reasonably wide limits without resulting in unsatisfactory performance or requiring any readjustment of the appliances used.

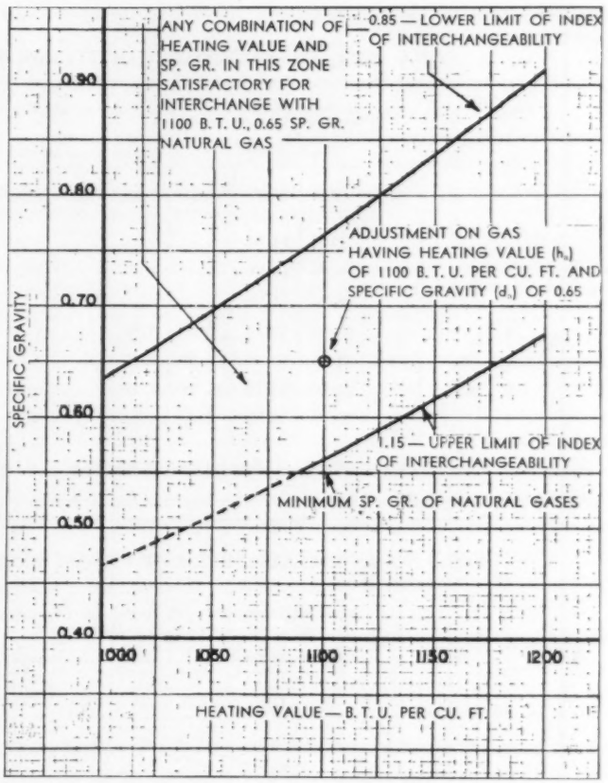

ANY COMBINATION OF HEATING VALUE AND SP. GR. IN THIS ZONE SATISFACTORY FOR INTERCHANGE WITH 1100 B. T. U., 0.65 SP. GR. NATURAL GAS
0.85 — LOWER LIMIT OF INDEX OF INTERCHANGEABILITY
ADJUSTMENT ON GAS HAVING HEATING VALUE (h,) OF 1100 B.T.U. PER CU. FT. AND SPECIFIC GRAVITY (d,) OF 0.65
1.15 — UPPER LIMIT OF INDEX OF INTERCHANGEABILITY
MINIMUM SP. GR. OF NATURAL GASES
SPECIFIC GRAVITY
0.90
0.80
0.70
0.60
0.50
0.40
1000
1050
1100
1150
1200
HEATING VALUE — B. T. U. PER CU. FT.

FIG. 1

Power unit used in field work which supplies 110 volt AC current and has a capacity of 1000 watts. Portable field antenna in the distance.

▼

2. The extent of variations which can be safely tolerated in natural gas composition is reliably established by the A.G.A. Mixed Gas Formula:

$$C = \frac{h_t A_t d_a}{h_a A_a d_t} + \left(\frac{h_a A_a}{5000\ E_a\ F_a} - \frac{h_t A_t}{5000\ E_t\ F_t} \right)$$

C = index of change in performance of appliances. For continued satisfactory performance of appliances when the gas on which they have been adjusted to perform satisfactorily (adjustment gas) is to be replaced by another gas (test gas) the value of C should be held between 0.85 and 1.15,

h = gross or total heating value, B.t.u. per cu. ft.,

A = air theoretically required for complete combustion, cu. ft. per cu. ft. of gas,

d = specific gravity (air = 1.0),

E = the heat capacity of the theoretical products of combustion 60° F. to 1600° F., B.t.u.,

= 0.029V CO_2 + 0.023V H_2O + 0.0189V N_2, where V = volume of each product as indicated by the respective subscripts CO_2, H_2O and N_2, formed by the combustion of 1 cu. ft. of gas with the air theoretically required for complete combustion, cu. ft., and 0.029, 0.023, and 0.0189 = heat capacity of each product of combustion 60° F. to 1600° F., B.t.u. per cu. ft.,

F = summation of the products of the mol fraction and a constant resolving each combustible constituent to the basis of equivalent free hydrogen,

= H_2 + 5.36 CO + 27.3 CH_4 + 38.7 C_2H_6 + 80.8 C_4H_{10} + 7.4 C_2H_2 + 15.0 C_2H_4 + 27.4 C_3H_6 + 63.3 C_3H_8 + 78.0 C_6H_6

where H_2, CO, CH_4, etc. = mol fraction of each combustible constituent in the gas, and

a and t = subscripts designating the adjustment gas and test gas respectively.

provided the value for the index of interchangeability "C," as calculated, does not exceed 1.15 nor fall below 0.85.

3. For typical natural gases the first term of the expression given in the preceding item may be employed with acceptable accuracy, thereby simplifying calculations. This simplified form may be stated as:

$$C = \frac{h_t A_t d_a}{h_a A_a d_t}$$

• IN 1933 THE American Gas Association Testing Laboratories issued Report No. 689 covering the utilization of various mixtures of natural gases and modified manufactured gases together with a formula for determining limits in mixing city gases. This report has been of great value to the industry during a period when gases in many areas have undergone change, modification, and temporary substitution. In his paper, "Limits of Flexibility of Gas Appliances Operating on Natural Gas," presented before the Technical Section of the 17th Annual Distribution Conference in Houston, Texas, May 7-9, 1940, R. M. CONNER, director, A. G. A. Laboratories, offered additional data on this same general subject. (Abstract by G A S).

TABLE NO. 1. CHARACTERISTICS OF TYPICAL NATURAL GASES DISTRIBUTED IN THE UNITED STATES

No.	Chemical Composition—% by Volume (Dry Basis)										Heating Value B.t.u./Cu. Ft. Dry Basis (Calculated)	Specific Gravity (Air=1.0) (Calculated)	Primary Air Factor* $\frac{1000\sqrt{d}}{H}$	Combustion Constants (Values Given as Cu. Ft. Per 100 B.t.u. of Gas Burned)		
	Combustibles					Non-Combustibles								Air Req'd	Dry Products	Total Products
	H_2	CO	CH_4	C_2H_6	C_3H_8	C_4H_{10}	Ill.	CO_2	O_2	N_2						
1	....	....	84.50	14.50	.....	....	....	0.20	0.20	0.60	1116	0.632	0.711	0.94	0.85	1.04
2	....	....	74.00	15.20	.....	....	....	0.10	0.30	10.90	1023	0.676	0.802	0.94	0.85	1.04
3	....	....	96.90	1.90	.....	....	....	....	0.10	1.10	1018	0.569	0.740	0.94	0.84	1.04
4	....	....	65.43	10.20	5.80	0.80	....	1.50	1.85	14.42	1021	0.760	0.852	0.94	0.86	1.05
5	0.50	0.40	46.90	11.40	9.00	3.50	....	1.90	1.80	24.60	1033	0.887	0.910	0.93	0.86	1.04
6	....	....	58.90	14.50	11.40	4.40	....	0.20	1.80	8.80	1298	0.864	0.716	0.93	0.85	1.03
7	....	....	90.98	3.10	1.71	0.68	....	....	....	3.53	1047	0.612	0.746	0.94	0.85	1.04

*Based on equal pressures: (d) denotes specific gravity and (H) heating value.

TABLE NO. 2. CHARACTERISTICS OF TYPICAL HIGH B. T. U. OIL GASES AND LIQUEFIED PETROLEUM GASES

No.	Chemical Composition—% by Volume (Dry Basis)										Heating Value B.t.u./Cu. Ft. Dry Basis (Calculated)	Specific Gravity (Air=1.0) (Calculated)	Primary Air Factor* $\frac{1000\sqrt{d}}{H}$	Combustion Constants (Values Given as Cu. Ft. Per 100 B.t.u. of Gas Burned)		
	Combustibles					Non-Combustibles								Air Req'd	Dry Products	Total Products
	H_2	CO	CH_4	C_2H_6	C_3H_8	C_4H_{10}	Ill.	CO_2	O_2	N_2						
A	20.30	1.50	38.10	5.00	.....	....	16.45	0.30	0.20	8.15	1087	0.716	0.778	0.89	0.83	0.98
B	18.63	1.38	35.00	4.59	.....	8.31	24.28	0.28	0.18	7.35	1276	0.829	0.714	0.90	0.84	0.99
C	30.80	2.30	32.30	2.80	.....	....	23.30	0.40	0.25	7.85	918	0.615	0.855	0.87	0.81	0.96
D	....	....	.....	.....	22.15	77.85	....	....	....	.....	3207	2.000	0.441	0.92	0.85	1.00
E	....	....	.....	8.80	91.20	....	....	....	....	.....	2503	1.506	0.490	0.93	0.85	1.01

*Based on equal pressures: (d) denotes specific gravity and (H) heating value.

and the limits of 0.85 and 1.15 given in item No. 2 are applicable.

4. Further simplification can be effected by use of the expression:

$$C = \frac{h_t^2 d_a}{h_a^2 d_t}$$

which eliminates one variable and yields for typical natural gases values of the index of interchangeability "C" closely approximating those obtained by use of the A.G.A. Mixed Gas Formula or its modified form shown in item No. 3. Limits of 0.85 and 1.15 should, therefore, also be applied when this expression is employed.

5. Limiting values on the index of interchangeability factor "C" of 0.85 and 1.15, as calculated from either of the three expressions given, were established empirically by laboratory tests on a representative group of gas appliances. Under field conditions these limits can often be safely exceeded without objectionable increase in customer complaints, particularly for short time intervals.

6. Limits of interchangeability previously indicated may be appreciably extended by adjusting appliances so as to produce soft flames when the gas having the highest

$$\frac{h^2}{d}$$

value is supplied, and to yield relatively hard flames when the gas having the lowest

$$\frac{h^2}{d}$$

value is supplied. In addition, adjustments made on the gas having the lowest value for

$$\frac{h^2}{d}$$

can be such as to produce input rates lower than the manufacturer's specified value, if this would not seriously decrease the speed or capacity of the appliance.

7. Control of gas mixing, dispatching, and other processes to maintain composition of natural gases distributed to customers within acceptable limits may be effectively accomplished by one of two methods, namely:

a. By application of one of the three expressions given. For example, the expression

$$C = \frac{h_t^2 d_a}{h_a^2 d_t}$$

can be placed in the form

$$C = K\frac{h_t^2}{d_t}$$

where K equals the quotient of the specific gravity (d_a) and the square of the heating value (h_a) of the gas on which appliances have been or are assumed to have been adjusted. The term

$$K\frac{h_t^2}{d_t}$$

can then be successively equated to 0.85 and 1.15, and for each equation values of h_t can be calculated for predetermined values of d_t. Curves defining these points can then be drawn and the curves so defined form the boundaries of various combinations of h_t and d_t which can be satisfactorily accommodated by appliances adjusted on a gas having a heating value of h_a and a specific gravity of d_a.

For example, Fig. 1 shows such curves based on an adjustment gas having a heating value (h_a) of 1100 B.t.u. per cu. ft. and a specific gravity (d_a) of 0.65. Such curves made up for conditions encountered in a given community and used in conjunction with recording calorimeter and specific gravity readings constitute a convenient means for controlling variations in gas composition.

b. By observing variations in flame heights on a simple Bunsen type burner, limitations

on such variations being obtained by correlation with performance of a representative group of appliances. At least two burners, one adjusted on the gas composition giving the highest h^2 value divided by d value and the other on that gas with the lowest value for this factor, should be employed. Burners should be adjusted to a gas rate of 20,000 B.t.u. per hr. per sq. in. of port area. Adequate control could obviously be effected by reference to appliance performance, although this method would be tedious due to the number of observations required. An automatic flame height recorder is available for this purpose.

8. Where burning characteristics of gases that are to be interchanged for, or mixed with, a natural gas differ widely from those of the natural gas, the A.G.A. Mixed Gas Formula should be employed to determine the propensity of such standby or peak load gases (high B.t.u. oil or liquefied petroleum gases) to give noisy burner operation. Since the A.G.A. Mixed Gas Formula does not take into consideration relative tendencies of various types of gases to burn with yellow tips or smoky flames, the considerable difference between natural gases and high B.t.u. oil or liquefied petroleum gases in this respect may be determined by employing characteristic yellow tip limit curves given in this paper.

a. Use of characteristic limit curves for this purpose requires that such curves for the natural gas and high B.t.u. oil or liquefied petroleum gas be selected for the corresponding gases shown in Figs. 2 and 3, having properties similar to gases involved (interpolation or extrapolation of curves in Figs. 2 and 3 can be readily made for this purpose). Tables No. 1 and 2 show properties of gases referred to in Figs. 2 and 3 respectively.

An adjustment point typical of those prevailing with the appliances operating on natural gas is then located on the graph including the foregoing curves (a point equivalent to 20,000 B.t.u. per hr. per sq. in. of port area and 40% primary air may be selected in the absence of specific average data). The change in this adjustment point, resulting from differences in heating values and specific gravities, may be readily calculated on the basis that input rate is inversely proportional to the square root of specific gravities and directly proportional to heating values, and that primary air injection is directly proportional to the square root of specific gravities and inversely proportional to heating values (proper allowance for air contained in butane-air or propane-air mixtures should be made in determining primary air injection). The resultant point should then be located in respect to the characteristic yellow tip curve for the high B.t.u. oil or liquefied petroleum gas, and if above this curve no difficulty from smoky flames should be experienced from the interchange.

9. Adjustment of appliances on the base natural gas to compensate as much as possible for changes in input rate, primary air injection, and burning characteristics resulting from interchange of high B.t.u. oil gas or liquefied petroleum gases should generally be such as to produce well-rounded inner cones. For specific cases where the predominant tendency of the substitute gas is in the direction of yellow tips or smoky flames, adjustments on natural gas should be hard, whereas a soft adjustment is indicated in cases where the tendency to noisy burner operation as revealed by a low factor calculated from the A.G.A. Mixed Gas Formula is predominant.

10. Control of variations in gas composition, involving high B.t.u. oil or liquefied petroleum gases, may be effected as previously outlined, except that observations should be made of yellow tip occurrence and not confined to flame heights.

11. Variations in composition of natural gases which can be satisfactorily accommodated from the standpoint of complete combustion and satisfactory burner operation will not effect thermal efficiencies of gas appliances to any appreciable extent.

12. Design of appliances for maximum flexibility to accommodate variations in composition of natural gases requires relatively low input rates per sq. in. of burner port area. Areas of flue or venting outlets and secondary air openings should be somewhat larger than necessary for satisfactory aeration of flames and discharge of flue gases under correct adjustment conditions and pressure increases within narrow limits.

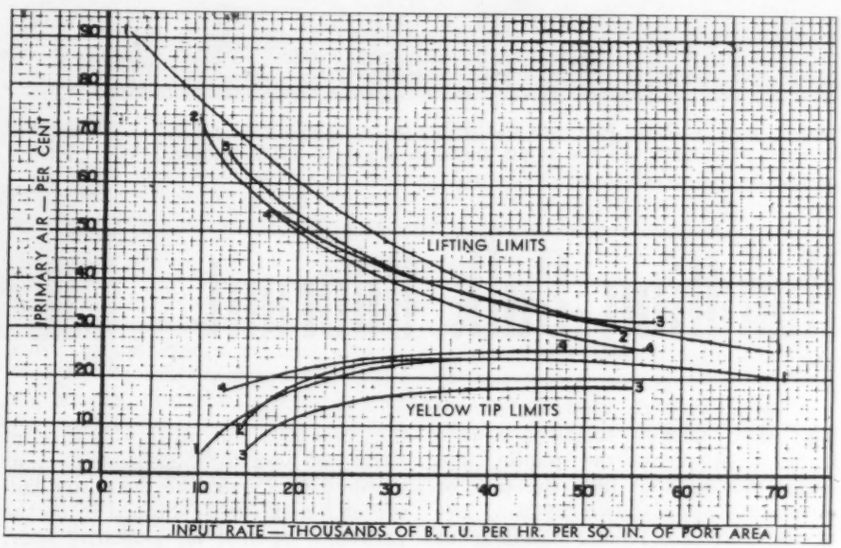


FIG. 2. Lifting and yellow tip limits for natural gases. Note: See Table No. 1 for properties of gases. Data obtained with No. 36 D. M. S. Port.

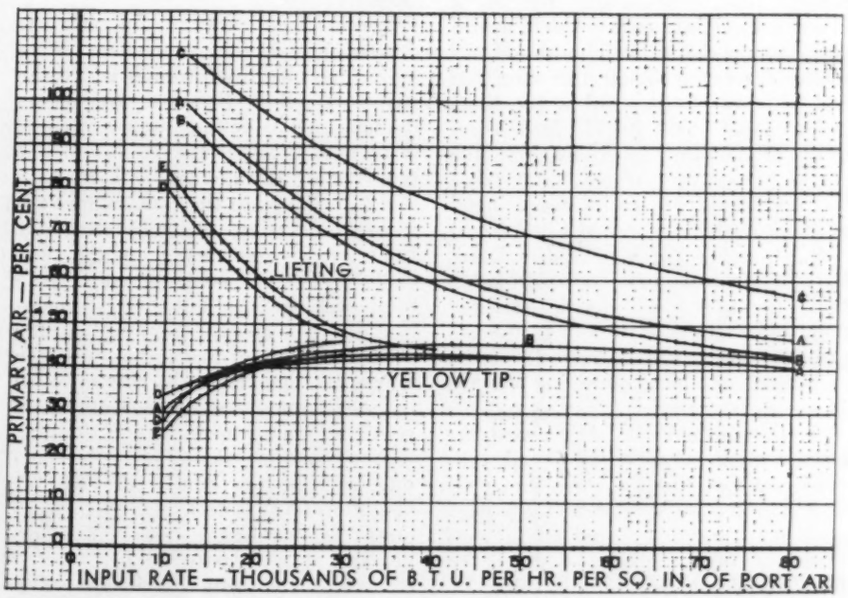


FIG. 3. Lifting and yellow tip limits for butane, propane and high B.t.u. oil gases. Note: See Table No. 2 for properties of gases. Data obtained with No. 36 D. M. S. Port. D—Butane; E—Propane; A. B. C.—Oil Gases.

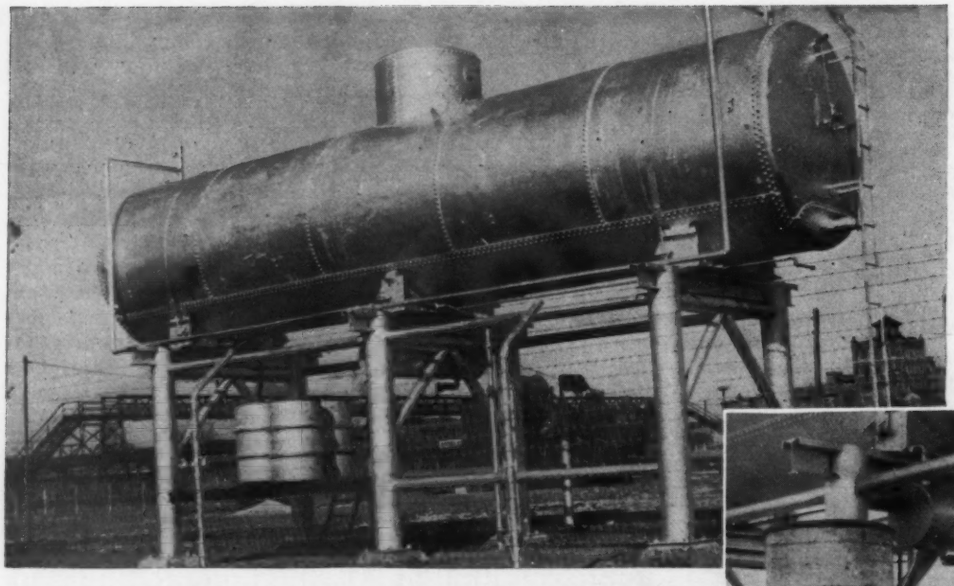


FIG. 1. High above the yard, this odorant tank affords gravity flow of fluid through a measuring unit into 55-gal. drums for shipment to local stations.

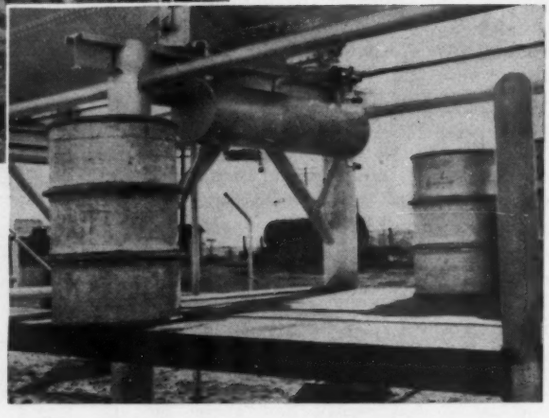


FIG. 2. (Below): Drum filling platform, with locked gate at bottom of measuring unit shown with short filling hose removed—as protection against pilferage during time no attendant is near—and specimens of extra heavy drums used for the transfer of odorant liquid. In picture at left (Fig. 1), vent line at left and filling line at right both enter tank at top, with filling line continued down within to below liquid level.

Handling Bulk Odorant

PUBLIC utilities must be always alert to please the public, and under this heading falls the task of preventing complaints concerning any of its activities. In the handling of liquid odorants for tracing or identifying leakage of gas, for instance, spilling of any amount of the highly concentrated fluid would set up a source of noxious odor which would permeate an entire neighborhood, its extent depending upon the direction and velocity of the wind at the time.

To enable it to handle bulk shipments of Calodorant without odor, the engineers for the Arkansas-Louisiana Gas Co. in Shreveport have developed at the Shreveport, La., and Little Rock, Ark., storage yards a method of handling the fluid through a closed system from the tank car into an elevated tank and from this storage to the 55-gal. drums in which the odorant is shipped to the local odorizing stations in each town served.

At the Little Rock, Ark., yard the storage tank is a reconditioned railroad tank car, lifted clear of its trucks and mounted on a welded cradle high enough to permit gravity handling of the fluid into drums and thence to trucks without any lifting being required. (See Fig. 1.) The elevated tank, equipped with dual gage glasses covering the entire capacity range of the container, and fitted with a relief valve set at a 2-lb. maximum, is of ample capacity to take the entire lading of a tank car as shipped in on the railroad. Spotted on a nearby spur, this car is connected to the usual odorant flow line, and then emptied by gas pressure drawn from a service main close by.

Special vent caps on the tank car domes permit the attachment of a ½-in. pressure line through which the gas, at the 8-lb. line pressure, enters the tank car above the odorant to force it to flow through the connection at the bottom of the car and through the 2-in. line into the tank. When the filling operation is completed, the lines are disconnected from the tank car and the gas content vented. The total cost of this "unloading" operation does not amount to more than the cost of 1000 ft. of gas and is probably much less than it would cost to move the same amount of fluid by the conventional pump method.

An interesting sidelight on the thoroughness of the care exercised for neighborhood protection and to safeguard against loss is the standing order that gage glasses be kept closed off except when actually checking contents of the tank. The exposed glasses sometimes prove too tempting targets for small boys with guns, and if broken while connected to the tank, would permit loss of large quantities of fluid.

Set closely under the center of the main storage unit, and connected to it with a short drop line and valve, is the measuring tank for filling drums. This is shown in Fig. 2. Designed to hold slightly less than 55 gals., this tank is equipped with a second connection to the main tank in the form of a vent line and valve, the vent reentering the tank above fluid level, and allowing the gas content of the measuring tank to be displaced over into the big tank as fluid enters through the filling line.

When the measuring unit is filled, closure of both valves—filling and gas venting—insures the retention of a full drum of fluid, and effectively prevents more than this amount being handled at one time. For transferring the fluid from measuring tank to drums for field stations, it is necessary only to open a small vent line tying into the larger line near its top, permitting gas from above the stored odorant to replace the fluid as it gravitates into the drum.

Utilizing gas pressure or gravity for all handling of the volatile fluid, the system can be manipulated easily by one man, affording economical and effective control of the odorant.

CHANGEOVER TO PROPANE-AIR GAS

(At Brainerd, Minnesota)

By ROBERT L. RUNDORFF Assistant Gas Engineer
Northern States Power Company

THE gas system at Brainerd, Minn., consisted of a plant having a 4-ft. three shell water gas set with the necessary condensing, scrubbing and purification equipment. The finished water gas of 520 B.t.u. was compressed and stored in six horizontal cylindrical pressure tanks of 10,000 cu. ft. capacity each at 100 lbs. per sq. in. Finished gas was distributed through a medium pressure system to 1170 customers at 2 lbs. per sq. in., each service being equipped with an individual service regulator set at 4 in. water column.

A change from this carbureted water gas to propane-air gas of the same B.t.u. required changes in the plant and conversion of customers' equipment as follows.

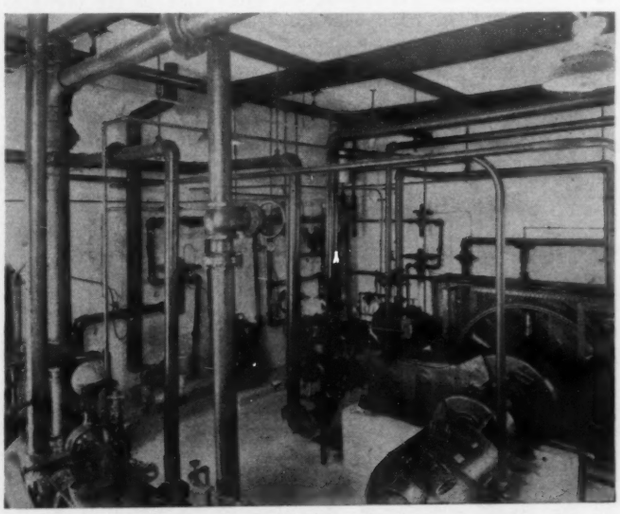
Construction to produce 520 B.t.u. propane-air gas consisted of a propane storage tank, necessary liquid and vapor regulators, he ers or vaporizers, mixing valves and check valves with the necessary automatic controls and piping, and is a standard installation. Finished gas is delivered to the suction side of the compressors which store the gas at 50 lbs. per sq. in. A safeguard is provided in a second compressor set to operate if the first compressor fails to start. If neither compressor starts, there is an alarm system to give notice of such failure. There is a steam driven compressor that can be operated in case of an extended electric outage. There was no change in the distribution system except that distribution pressures were increased to 3 lbs. per sq. in.

All of the old gas-making equipment was removed.

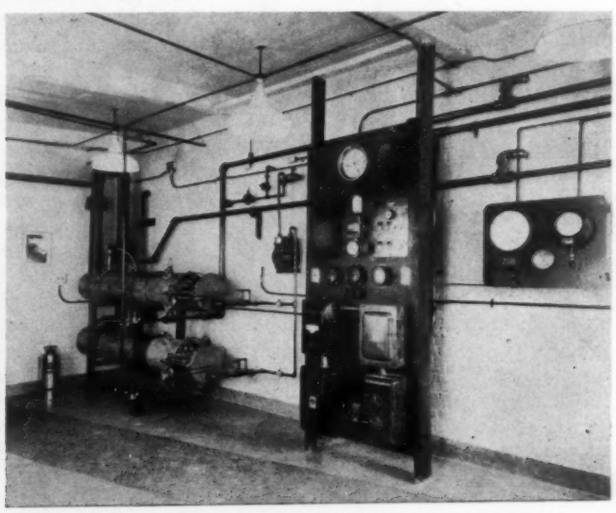
The information available on a changeover of this sort was that drilling of burner ports should be completed previous to the serving of propane-air gas, and that changing of orifice caps to the velocity reducing caps could not be done until after the new gas was available. This has resulted in the need for high pressure work by the conversion crew when the new gas was available in order to give the customer one or two burners that could be used. There have also been numerous complaints during the actual conversion, and some hazard due to the difficulty of lighting burners not equipped with velocity reducing spuds.

It was felt that there was a combination of velocity reducing orifices and flame adjustments that would give the customer passable service on water gas as well as on propane-air gas until such time as the conversion men could make final adjustments on all appliances. With this to work to, experiments were begun on representative equipment to determine what would be necessary to accomplish such an adjustment.

Sample velocity reducing caps, as obtained from equipment manufacturers, were used to test the representative equipment. With these velocity reducing caps it was impossible to get a clean, soft, high flame on water gas, so that when propane-air gas was turned on the resultant flame was too low and hard to light. By shortening the standard velocity reducing cap, having a 1/4 in. velocity reducing channel, it was possible to produce almost any type of flame with water gas. It was found that with a 3/16 in. velocity reducing channel, it was possible to adjust to a clean soft flame (just off the yellow) approximately 50% higher than normal with the air shutter about one-half open on water gas. Although high, this flame had a good turn-down and would give satisfactory service on turn-down. When propane-air gas was supplied to burners with this adjustment the resultant flame was 80% to 90% of normal height but in good adjustment and could be readily lighted. To adjust to



Compressor room, showing vaporizing, regulating and mixing equipment.



The control room, showing switchboard and heater for vaporizing the propane.

General view of the gas plant and storage tanks at Brainerd, Minn.

the proper propane-air gas flame it was only necessary to increase the gas to the burner slightly and adjust the primary air.

This idea of a 50% higher and very soft flame was tried out on all the equipment available and the results when propane-air gas was put on the burners without changing any adjustments was so satisfactory from a test standpoint that it was decided to change over the town as follows: All burner ports to be drilled, all orifices replaced with the velocity reducing type and all special burners changed on the first round. When this round was completed service of propane-air gas would begin and the conversion men would make another call on all customers to adjust burners to the proper B.t.u. input and proper flame.

Survey

A survey of all commercial and industrial customers, including doctors and dentists, was made and the gas equipment in use tabulated. This data was then used for ordering the necessary conversion materials for this group of customers. A survey of approximately 20% of the domestic customers was also made and was used as a basis for ordering materials for all domestic customers. This survey of domestic customers proved to be fairly representative, and since the material was more or less universal in nature, it was possible to carry out the changeover without issuing the material for each customer separately.

The crews were started out on the first adjustment round on October 2, 1939, and completed this round on November 5, 1939. The commercial customers were left to the last of this period so that their equipment had an adjustment approximately 50% above normal, and with a very soft flame for a very short time. The larger restaurants were adjusted on the last two days of the first period. During the last week of the first period, all automatic storage water heater burners, Electrolux burners and oil burner gas pilots were changed by two or three experienced conversion men. The lodges and churches having gas equipment were held over until propane-air gas was turned into the mains, although a few of them were adjusted during the last day or two of the first round in order to keep all of the crew busy.

When propane-air gas was turned into the mains at 8:30 A.M., November 6, 1939, we had a conversion man stationed at each of the larger restaurants. It was an easy matter for them to tell when the propane-air gas was at the burner for the burner flames which were approximately 50% higher than normal and very soft receded to 80% to 90% of normal and became slightly hard. After minor adjustments they proceeded to check other restaurants and the larger commercial customers. After completion of this first check of the restaurants and commercial customers and during the waiting period for the B.t.u. of the propane-air gas to even out, the crew worked on the adjustment of equipment in lodges and churches, and on a few pieces of special equipment that could not be worked until the new gas was in the mains.

The B.t.u. was watched closely and on the third day the gas was considered uniform enough to go ahead with a recheck of all appliances. After completion of the recheck of commercial customers, all domestic customers' equipment was checked and readjusted where necessary, and all automatic water heaters and Electrolux refrigerators were checked.

The second adjustment round was completed on November 29, 1939, with only three of the crew continued on the job for a week to clean up the loose ends and to recheck the larger restaurants.

A relatively small number of complaints resulted from these operations. Undoubtedly there were some adjustments made by the conversion men that were not according to their instructions, and it is felt that if all adjustments had been made similar to the test adjustments even fewer complaints would have been received. It is believed however, that the changeover at Brainerd was carried on with the least possible inconvenience to the customer, that on the whole the gas equipment throughout the town was left in first class condition and that the methods used were new and proved to be successful.

■ ■

Western Natural Gas Co. Proposes 770-Mile Line

THE Western Natural Gas Co., Wilmington, Dela., has recently applied to the Federal Power Commission for permission to extend a natural gas pipe line from the Hugoton field in southwestern Kansas to Milwaukee, Wis., a distance of 770 miles. The line would run through the state of Iowa with perhaps laterals to Nebraska and Missouri. The costs are estimated at $30,000,000.

The new company proposes to sell gas only to industrial consumers and to public utility companies for resale and will not operate any facilities for the public distribution and sale of natural gas at retail. The line would affect the cities of Milwaukee, Madison, Beloit, Janesville, Racine, Kenosha, and Port Washington, Wis.; Dubuque, Iowa, and territory adjacent to them.

Paul Kayser, president, claims the cost to purchasers would be less than the cost of the manufactured gas now being supplied in these areas.

■ ■

Three Nebraska Towns to Receive Natural Gas

Natural gas will be made available to the residents of McCook, Neb., about July 25, it has been announced by the Aksarben Natural Gas Company of McCook. The company has recently purchased the city's manufactured gas distribution system, and plans to begin service at the same time in the towns of Indianola and Bartley, Neb.

The natural gas will be brought to the towns through a 25-mile pipe line now being constructed from Cambridge to McCook by the Kansas Pipe Line & Gas Co. This company is also laying the laterals to Indianola and Bartley.

The Aksarben company has recently established its headquarters in McCook.

■ ■

Plan Consolidation of Five Indiana Companies

A petition was recently filed with the Public Service Commission of Indiana to consolidate five public utility companies serving adjacent sections of central and southern Indiana into a single corporation. The new corporation would be named the Public Service Company of Indiana, Inc.

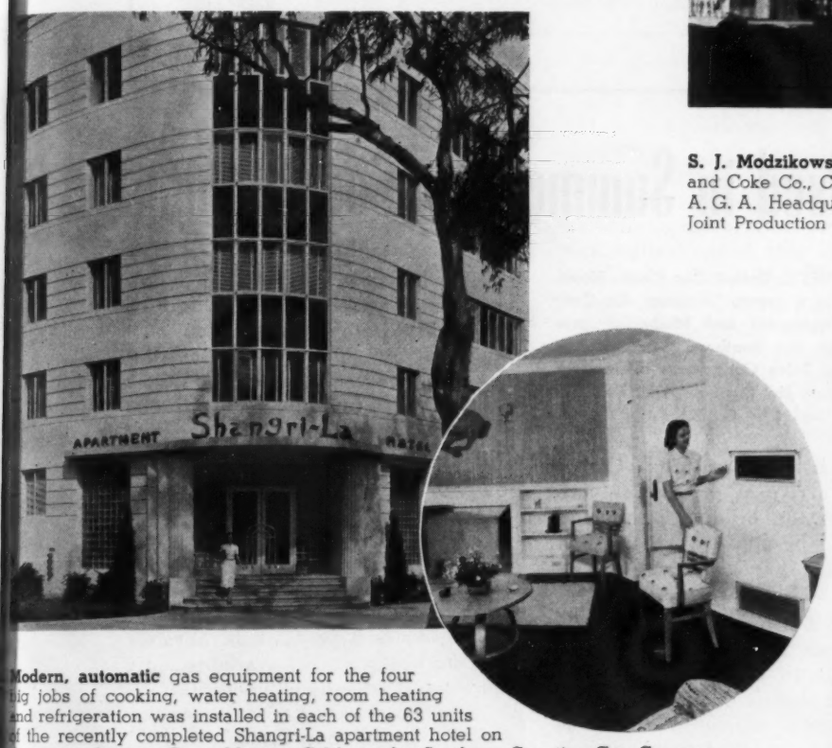
The five companies involved in the integration plan are the Public Service Company of Indiana, Central Indiana Power Co., Northern Indiana Power Co., all of Indianapolis, and Terre Haute Electric Co., Inc., and Dresser Power Corp.

PRINT IN BINDING

GAS Camera

—*Photo by A. Gordon King, service engineer, A. G. A.*

S. J. Modzikowsky, chairman, Chemical Committee, The Peoples Gas Light and Coke Co., Chicago, Ill., and H. W. Hartman, secretary, Technical Section, A. G. A. Headquarters, New York, addressing the sessions at the A. G. A. Joint Production and Chemical Conference held in New York on May 20-22.



Modern, automatic gas equipment for the four big jobs of cooking, water heating, room heating and refrigeration was installed in each of the 63 units of the recently completed Shangri-La apartment hotel on the ocean front in Santa Monica, Calif., in the Southern Counties Gas Co. system. Each of the apartments is equipped with a modern, automatic gas range and Servel refrigerator, and a gas-fired boiler supplies hot water. A portion of the building is heated with individual two-way gas wall furnaces, installed in living rooms and bedrooms; while special forced air units supply heating and ventilating to the balance of this modern building. Bathrooms are heated by hot water units set in the wall. The building architect was William E. Foster.

East meets west as Glen Miller, Southern Counties Gas Co., Los Angeles, Calif., is greeted by W. S. Anderson, manager, industrial division of the Boston Consolidated Gas Co., at the American Gas Association's Industrial Sales Conference held in Toledo, Ohio, March 28-29.

Eugene D. Milener, secretary, A. G. A. Industrial Gas Section, and Charles W. Gale, sales manager, The Knoxville Gas Co., Knoxville, Tenn., urging on the Negroes they sponsored in the battle royal, a feature of the barbecue entertainment at the American Gas Association's annual Hotel, Restaurant and Commercial Sales Conference held May 30-31 at Atlanta, Ga. (See story on Page 62.)

Richard W. Shank, superintendent of production, Central Illinois Light Co., Peoria, Ill., with his aides, inspects equipment at the Springfield gas plant. Left to right, inside the plant, are: George H. Shank, Thomas Gilmore, Oscar Vogel, George Ausmus and Les M. Hadley.

TABLE NO. 1. AVERAGE FIGURES FOR SEVEN INSTALLATIONS

Gas rate	$0.25—$0.60 per M c.f.
Power rate	$0.02—$0.035 per kw. hr.
Average tonnage	40
Average load factor	82
Average hours of operation per month	242
Average cost per hour per installed ton	$.018
Kw. hrs. per hr. per installed ton	0.42
Cu. ft. per hr. per installed ton	20
Per cent cheaper than electric system	30

TABLE NO. 2. DATA ON 15-TON INSTALLATION WITH 100% LOAD FACTOR

	Gas-Fired Absorption System		*Electric Compression System*
	Kw. Hr. Per Ton	M c.f. Per Ton-Hr.	Kw. Hr. Per Ton
Condensing Water Pump	0.200	.....	0.160
Chilled Water Pump	.043	.....	.....
Solution Pump	.096	.....	.....
Fan	.131	.....	0.131
Steam Generator	.....	.0224	.....
Compressor	.....	.....	0.880
TOTAL	.470	.0224	1.171

Equipment and Methods Used in Summer Air Conditioning

• **C. A. McKINNEY, United Gas Corp., Houston, Texas, in a paper, "Summer Air Conditioning—Equipment and Methods," presented before the Southern Gas Association and Gas Sales Conference meeting at Hotel Arlington, Hot Springs, Ark., Feb. 12-14, 1940. (Abstract by GAS.)**

DURING 1939 the United Gas Corp. made 16 installations using Air-O-Matic equipment and detailed operating costs were recorded on many of the installations. Tonnages installed varied from the smallest at 10 to the largest at 140.

Operating data secured during the past cooling season have shown conclusively that gas absorption air conditioning systems operate from 20% to 40% cheaper than conventional electric compression type systems. From data obtained from actual installations hypothetical analyses of comparable electric compression systems were set up. The utility rates in effect are the principal factors governing variations in savings in operating costs.

Operating Costs

Total operating costs varied from 9 mills to 3 cents per hour per installed ton of refrigeration. Since there are so many variables which influence the competitive standing of gas and electric equipment, only generalizations and average figures can best represent the overall picture.

Table No. 1 shows average figures for seven installations varying from 13 to 62 tons of refrigeration. Power consumption in kw. hrs. includes that for all electric motors, *i.e.*, fan, cooling tower pump, chilled water pump and solution pump. Gas consumption is based on 1000 B.t.u. per cu. ft. The cost of water for cooling and condensing purposes has been found to be negligible compared to total cost, as the only water required is that used to make up that lost by evaporation and drift in the cooling tower.

The load factor on each installation was calculated on a basis of the ratio of actual gas consumption to theoretical at design operating conditions as determined by factory tests. Consequently, to arrive at actual gas consumption per ton produced, the load factor should be applied. This results in an average gas consumption per ton-hour of 24.7 cu. ft.

Table No. 2 is based on actual data obtained from a 15-ton Air-O-Matic installation with 100% load factor. Comparative electric compression type operating data is estimated on a basis of a ton of refrigeration requiring one horsepower and with a motor efficiency of 85%. Cooling water requirements being comparatively small, are omitted from the computations.

Subtracting the kw. hr. required of the electric system from that required of the gas system there remains 0.701 kw. hr. per ton. Considering it from one standpoint, this is the amount of energy which the electric system has to supply to correspond to 22.4 cu. ft. of 1000 B.t.u. gas used by the absorption system to produce one ton-hour of refrigeration.

For equal operating costs between electricity and gas on a basis of the above data, electric and gas rates should correspond about as follows:

Electricity Cts. per Kw. Hr.	*Gas (1000 B.t.u.) Cts. per M c.f.*
1.0	31.3
1.5	47.0
2.0	62.6
2.5	78.3
3.0	93.9
3.5	109.6
4.0	125.2

It will be noted in Table No. 1 that the average kw. hr. consumption of several installations was 0.42. This means that for the larger size installations the above comparison would be slightly more favorable toward the gas system than shown.

Maintenance costs have been at a minimum on the installations during the first season's operation; in fact, there have been no costs which might be termed as such. It is generally conceded that maintenance costs should be considerably less than that required of compression type systems, however exact figures will be available only after several seasons of operation.

Installation Costs

A survey of the range of electric competitive prices submitted to the owners on the installations in which Air-O-Matic equipment was purchased shows that a premium was paid for the latter. In some cases the spread between the lowest competitor's price and the installed Air-O-Matic contract price was as much as $3800 on a 60-ton installation, and $1000 on a 15-ton installation. This clearly indicates that "Mr. Public" is willing to pay more for equipment if he is sure that he can make a return on the investment. His return comes in lower operating and maintenance costs.

Air-O-Matic installations furnishing complete year-round air conditioning systems have been contracted for amounts ranging from $190 per ton for 60-ton installations to $350 per ton for 12-ton installations. Some inherent characteristics of absorption equipment naturally call for more equipment and installation costs than electric compression systems. New designs in equipment will eliminate some of the present installation costs; simplify operation of certain component parts.

Gas Comes to a New Home

A Story in Pictures That Shows How Southern California Gas Co. Each Year Connects from 15,000 to 30,000 New Domestic Services

PERHAPS nowhere in the industry have pipe laying practices and methods received a more thorough overhauling than in the system of the Southern California Gas Co., Los Angeles. During the past five years, with from 15,000 to 30,000 service connections to make annually, company engineers have overlooked no possibility in speeding up, simplifying and improving the technique of pipe installation. The entire street main and service department, from the superintendent down to the most recently employed helper, has been put on the alert for newer and better ways of doing things. An idea, however fantastic, is not rejected until it has been examined, weighed, and, if possible, tried.

The result of this collaboration — and it is a collaboration that is still continuing — is a completely mechanized and self-contained service installation unit, streamlined to the limits of human ingenuity. *GAS* presents here a pictorialization of this new and tremendously interesting West Coast development. Picking up a typical service crew, from the moment, at eight o'clock its five-man squad leaves the yard until a 90-ft. service is in the ground, connected, and brushed up, the photographer tries to depict each successive and oftentimes simultaneous operation.

Southern California Gas Co. now has 40 of the larger units in operation over its system; 32 serve the Los Angeles metropolitan area, and the balance are scattered in the outlying divisions. This equipment is typical insofar as tool and equipment arrangement are concerned.

For those interested in specifications the following weights and dimensions of this particular truck are fairly representative of this larger type unit:

Unladen weight of unit without the compressor is 11,770 lbs.; with the compressor, it is 14,270 lbs.; present gross weight is 18,500 lbs.; springs and tire capacity are built to hold allowable gross of 19,000 lbs.

The truck body is 96 in. wide and the wheelbase is 157 in.; total overall length of body is 21 ft. 7 in.; and load length is 12 ft. 3 in. The compressor is a standard gas-engine driven unit of 105-ft. capacity.

1 It's off to work we go. The five-man crew, consisting of a fitter-welder, and three helpers, leave the street main and service department of the gas company, riding in comfort in the roomy cab of their mechanized unit.

(Photographs by John R. Leff)

2 Safety first. Arriving on the job, every man has his assignment. While two helpers barricade the working area with excavation warnings, the fitter-welder and the third helper spot the main with a radio pipe locator. The inevitable kid kibitzer puts in an early appearance. Note traffic warning stripes painted on back panels of truck. In standard practice, the truck is spotted on the traffic side of the service location to provide additional barricade. Here, such a position would have blocked a driveway.

3 The compressor is made ready. Helper William Dejan readies built-in compressor for next operation. For safety, truck is parked away from the curb and all operating mechanism and essential tools are placed on curb side of truck.

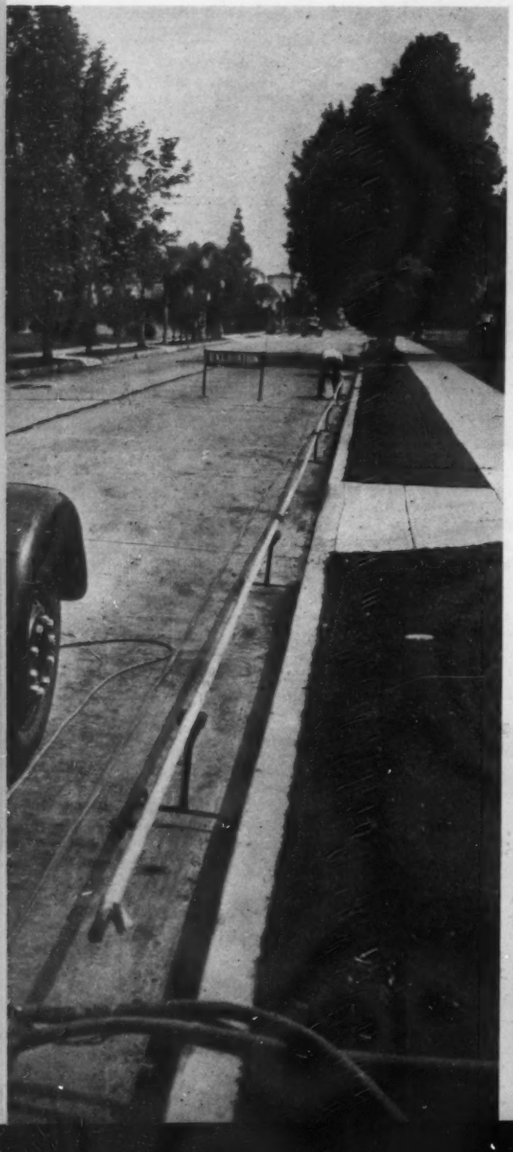
4 The pavement gets a break. Economically using a pavement seam for one side of the hole, Helpers B. C. Walker (left) and William Dejan break concrete to reach main. Note metal protectors on men's shoes. Safety first again!

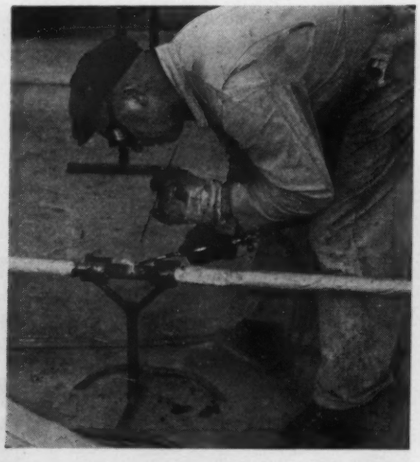
5 **Sticks and stones may break my bones.** Standard safety practice, growing out of an alert workman's suggestion, now requires raking up of loose boards, brick, rock and similar construction litter along path of service to prevent injuries. Helper J. Gross does this job.

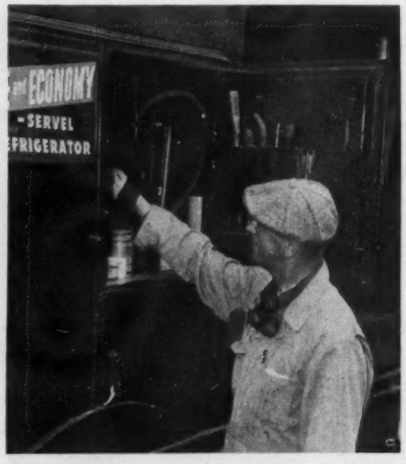
6 **The fitter-welder gets busy.** Pipe joints and fittings are all welded in modern practice. While the helpers are uncovering the main, Fitter-Welder R. O. Montgomery goes about his job of getting the welding equipment ready. Each man in the crew, trained in his duties, goes about his special task without prompting.

7 **His first job's a pipe.** Before removing the service pipe from the truck, Montgomery makes sure it is clean by swabbing out each section. All pipe used in the Southern California Gas system is cleaned, tarred, and wrapped at the pipe-yard. Cellophane — waterproof, durable—is used in wrapping pipe.

8 **Ninety feet of service.** Having determined the length of pipe needed, the fitter-welder lays out sections on especially designed roller racks placed along curb ready for welding. Note protecting sign.





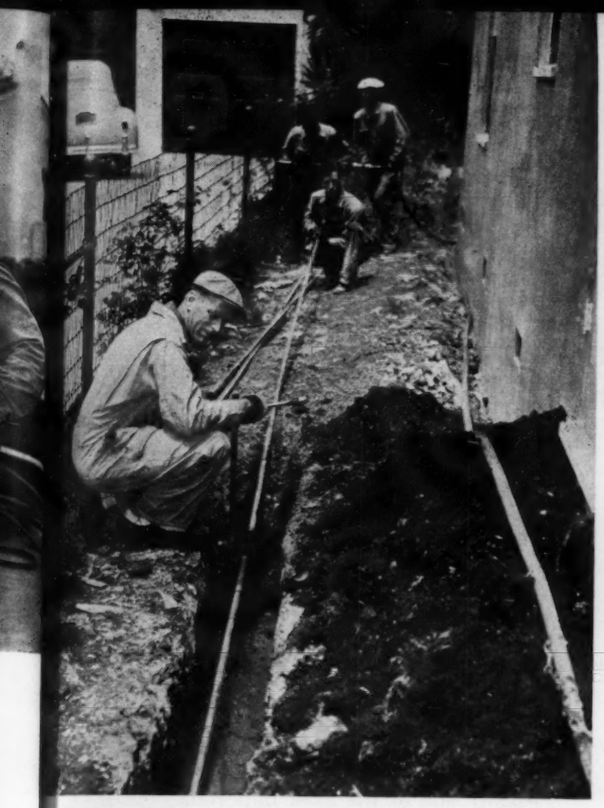


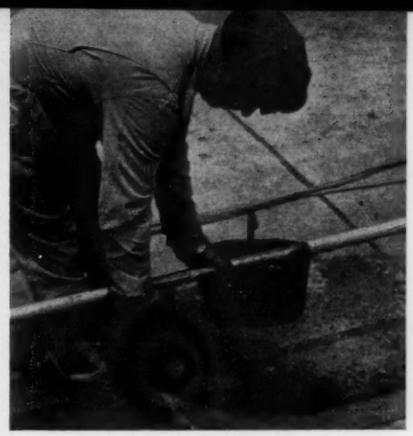
9 **The pipe is welded.** A handy rack supports the joint as R. O. Montgomery welds it. The pipe may be rolled for welding convenience by a simple twist of the wrist.

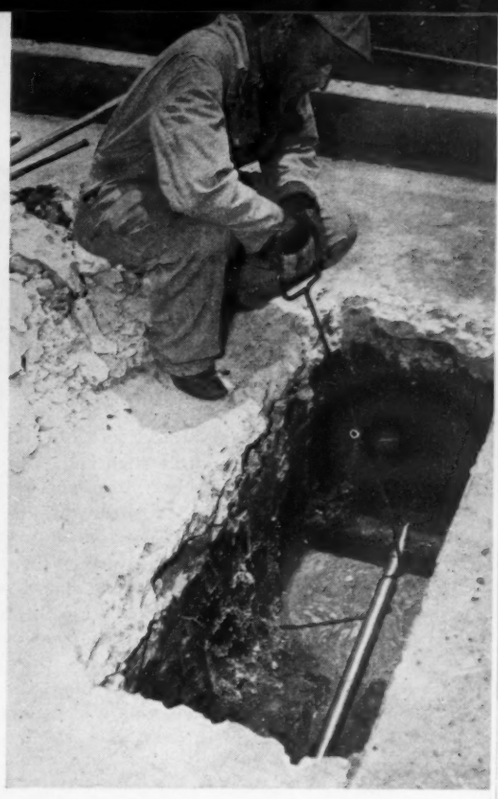
10 **A place for everything.** Foreman Arnold Salveson has his duties, too, and not the least of these is to see that tools are replaced where they belong. Note handy compartment.

11 **A bit of a bore.** The two-pronged gadget on which Foreman Salveson is working is a fish-tailed bit that will be used in boring the service hole. He is giving the bit an edge. Note goggles which are standard equipment carried by each man on the job at all times.

12 **Now comes the test.** Meanwhile Fitter-Welder Montgomery's job is nearing completion. His welding finished, he clamps an air hose on one end of the service pipe line and tests his work under 75 pounds pressure—certainly an ample margin of safety!







13 **The boring machine goes into action** (left). Everyone except the fitter-welder gets busy with the recently developed power-driven boring machine. With a sighting apparatus, Foreman Salveson has drawn a bead on the main location, and the rotating fish-tailed bit, augmented by a stream of water, bores a hole 90 ft. to the street. Only excavations are the trench for depth, two holes to check progress of the drill, and the hole at the main.

14 **He tars and wraps** (above). Before the pipe is ready to go in the ground, the joints must be tarred and wrapped. Wet pavement prevents tar-droppings from sticking.

15 **The marksmanship is expert** (right). The boring crew has scored a bulls-eye.

16 **Ooh, look! It's all oogey!** But hold everything! Kid Kibitzer is taking his girl friend on an inspection tour. A portable tank carries gas to heat tar.

17 **The service is swung into place.** And now the whole crew swings the 90-ft. service into place. Inserted in the hole the boring machine has driven, it will be pushed easily out to the main. The installation of this service here dramatized was completed in the forenoon of one day.

18 **The main is tapped.** Then Fitte Welder Montgomery welds a t to the main, preparatory to tapping f the gas supply. The connection is ne

19 **And now for the clean-up.** The hole in the street refilled and tamped with an air tamper, the helpers now cover the spot with a temporary filling of oil and gravel. Later the city street department will replace concrete and the only evidence of a service installation will be a small patch.

20 **Curtain call.** And as the curtain goes down on our little drama, the actors con out before the footlights and take a bow. Uniforms are furnished by compan Left to right: Helper William Dejan, Helper B. C. Walker, Helper Jimmy Gross, Forema Arnold Salveson, Fitter-Welder R. O. Montgomery, J. D. Staples, general street forema

Home Service Looks Ahead

By ELIZA M. STEPHENSON
Chairman, A.G.A. Home Service Committee

WHAT will the Home Service Committee of the American Gas Association do for the Gas Industry this year? The answer is so far, possibly, only a hope or a prediction on our part. If the interest and enthusiasm with which the committee planned, and have progressed with, is an indication, there is little reason for speculation. Keynote of our program is "Cooperation."

It has been said many times that Home Service is a woman's department with trained personnel to help the homemaker with her problems, to interpret gas as a fuel and gas appliance features into the terms the homemaker understands. This experience and knowledge gained by Home Service representatives through close contact with our utility consumers is of value to every employe in the gas industry. The enthusiastic and conscientious interest of each employe is important, if we are to present a like story regarding gas as the ideal fuel for the four big jobs.

Ways and means to gain the cooperation of all employes for a better understanding of products and their advantages have been assembled to be used by Home Service departments. This report contains an amazing amount of material, which is diversified enough to be adaptable to the various Home Service departments.

It has seemed only natural, with the swing in selling psychology from the material of construction in gas appliances to the features which offer consumers higher standards of living, to find Home Service programs incorporating a definite sales slanted approach into their various activities.

It has been our experience that women are requesting visual demonstrations which show the advantages of the equipment, and this has proved one of the most productive means offered for selling the desire to own the product. As a department under the sales organization, Home Service has caught the new promotional trend that has been necessary to secure our share of the consumer's dollar.

A bulletin, "Home Service Aids in Promotion of the CP Range," has been released offering ways to incorporate into demonstrations the story of food savings, and its relation to health, drama, kitchen planning, fuel saving and time saving. In this material combined with the plans already found successful, Home Service will have the ammunition to contribute much to the CP gas range sales programs.

A study of gas cookery is being made with the idea of standardizing a Time and Temperature chart for baking and roasting in the CP range. The results of this committee's survey will be of assistance to Home Service representatives in building consumer confidence and satisfaction.

Home Service departments are accountable to the consumer for satisfactory performance in gas ranges. This fact has necessitated considerable testing throughout the country to ascertain what results may be expected when the customer purchases a range. To simplify the testing for Home Service and to assist manufacturers of gas ranges in a better understanding of field tests, a questionnaire has been circulated to collect information with the hope of standardizing tests adequate for Home Service department work.

It has seemed rather difficult to incorporate the water heating story effectively in Home Service programs. Realizing the importance of this load, three 10-minute talks have been prepared which may be used to promote the advantages of constant hot water to our homemakers in terms which we and they understand. The talks have been tested in one utility with excellent results.

We realize the gas load of tomorrow depends, in no small degree, upon modern instruction made available to the school children. From a very successful Home Service public school project, an outline with detailed suggestions has been compiled to interpret the advantages of gas as a fuel to school groups.

Possibly one of the most important contributions to guide Home Service programs in the future is the report started last year and just completed, "Cooking Survey." If you have not read the report I trust you will very soon. It is food for thought in planning Home Service activities.

To mention just a few of the high spots of the report; women said they did not know how to use the broiler; family too small to use broiler; family too small to use oven; broiler too hard to clean, and broiled food too expensive. These statements are familiar terms to Home Service representatives and their solution, I frankly believe, rests with the Home Service departments of our gas industry. The experience Home Service representatives have gained in these problems, coupled with the confidence they have established with the homemakers in their communities, gives a broader scope of Home Service activities.

The Home Service Committee program would not have been complete without some consideration being given to the much discussed "Consumer Movement." They are asking what to buy and how to buy and they expect dependable information based on actual tests of the appliance. Home Service representatives contact the utility consumers daily and know what the homemakers demand from an appliance for satisfactory results. With this in mind, material to answer these questions on gas refrigerators and ranges will be collected to assist Home Service and the consumer.

We of the Home Service Department have a unique opportunity and a definite obligation to the gas industry. In cooperation there is strength.

CALENDAR

July

Canadian Gas Association—Annual Convention, Jasper Park Lodge, Alberta, July 3-5.

Michigan Gas Association — Annual Convention, Grand Hotel, Mackinac Island, Mich., July 8-10.

Pacific Coast Gas Association Northwest Conference — Held in conjunction with Canadian Gas Association, July 3-5.

August

Appalachian Gas Measurement Short Course—Third annual meeting, University of West Virginia, Morgantown, Aug. 19-21.

September

Empire State Gas and Electric Association — Annual Convention, Westchester Country Club, Rye, N. Y., Sept. 26-27.

Pacific Coast Gas Association—Annual convention, Hotel del Coronado, Coronado, Calif., September 18-20.

October

American Gas Association — Annual Convention, Atlantic City, N. J., week of October 7.

December

National Association of Railroad and Utility Commissioners—Miami, Fla., Dec. 10-12.

It has the homing pigeon's instinct!

THE SECRET? CONTROL

Early aviators dreamed of a time when their ships would streak through fog and night with the homing pigeon's unerring instinct for home. Today's modern airliner *has* the pigeon's instinct . . . the direction-finder that keeps the ship on a straight, true course.

Greater *efficiency through control* has been brought to gas cooking, too, by the Harper Burner System. Based on a principle entirely different from other top burners, the Harper Burner System insures easy, accurate control of *every* shade of cooking heat . . . offers the housewife a better, more economical method of cooking than is available with any other fuel . . . sells her on gas—and keeps her sold.

Copr. 1940, Harper-Wyman Co.

CONTROL *is the secret here, too*

● The Harper Burner System is a patented invention whereby each of the burners on the range is actually 2 burners in 1 . . . a burner within a burner . . . both operated and controlled by a single handle.

This arrangement affords a high-speed STARTING BURNER to *start* foods boiling and for fast frying . . . plus a small, central, economical COOKING BURNER for *maintaining* the cooking. The COOKING BURNER can be used entirely independently of the STARTING BURNER. No other top burner possesses this vital advantage — which insures easy, accurate control: just the right heat for every type of top burner cooking . . . every time.

HARPER-WYMAN COMPANY
8562 Vincennes Avenue, Chicago, Ill.

HARPER BURNER SYSTEM

HARPER BURNER SYSTEM

Demonstrates GAS at its best

SEE OTHER SIDE OF THIS PAGE

The Harper Burner System eliminates

Guesswork in Cooking

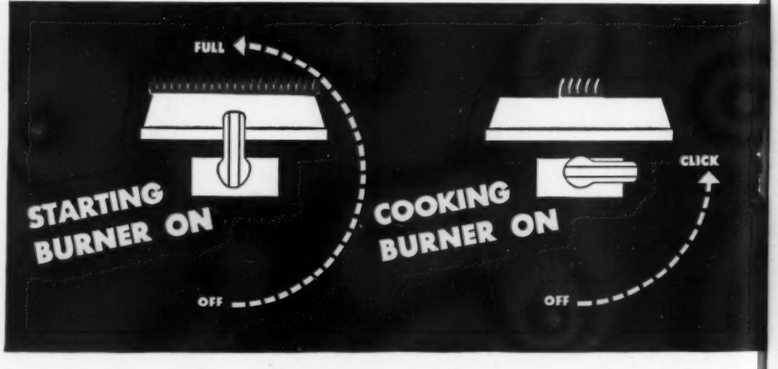
HARPER · BURNER SYSTEM

FACT: The Harper Burner System permits more flexible and accurate heat *control* than any other top burner . . . eliminates guesswork in cooking.

REASON: Regulating the ordinary burner is like trying to drive a car always in high gear . . . very low speeds are impossible. Harper construction is based on a STARTING BURNER and a COOKING BURNER that function as *distinctly separate* units, just as do the high and low gears of the automobile transmission. This of course increases the range of heat temperatures and control many fold. When lower heats are desired, the STARTING BURNER ceases to operate, and the COOKING BURNER (with its fewer flame ports) takes charge.

BENEFITS: The guesswork is taken out of cooking because the Harper Burner System makes it easier to gauge the exact amount of heat desired for every type of cooking. This *exact control* doesn't vary . . . with the Harper COOKING BURNER it always takes more than one hour to boil away one cupful of water in a covered vessel.

Substantial gas savings are possible, because this *exact control* has made practical new methods of cooking . . . less water is required. These new methods not only save cooking time and banish pot watching, but also help to retain more of the important vitamins and minerals in foods.



The Harper Burner System provides a burner within a burner. The diagram above shows how the COOKING BURNER operates entirely independently of the STARTING BURNER. Yet both are controlled by the same handle.

We shall be glad to send you, without cost, two booklets that tell the complete Harper Burner System story . . . "Modern Methods of Top Burner Cooking" and "The Greatest Cooking Discovery in 40 Years". They should be valuable to anyone interested in the promotion of gas cooking and gas appliances. *Harper-Wyman Company, 8562 Vincennes Avenue, Chicago.*

SEE OTHER SIDE OF THIS PAGE

HARPER BURNER SYSTEM

• **B. J. BEAN, sales manager, Worcester Gas Light Co., Worcester, Mass., in a paper, "A Low-Priced Heating Burner," which appeared in the December, 1939, issue of "The New England Gas News," published by the New England Gas Association, 41 Mt. Vernon St., Boston, Mass. — (Abstract by GAS.)**

THE success of a recent kitchen heating program inspired us to build a house heating program that would interest the mass market — especially the lower-income group customers who are home owners. There have been many small compact houses built in Worcester in the past and now history repeats itself. More small, low-priced homes have been built this year in our territory than any other type of home.

We endeavored to build our plans to be consistent with circumstances, with the co-relative factors of small incomes, small homes, small equipment prices and small fuel costs.

We believe we have successfully designed a rate which protects our domestic load income and which gives low-priced heating gas to the small home owner, as well as the large user. This is accomplished by a simple but comprehensive demand factor which is an integral part of the rate rather than a separate demand factor, which is usually an added irritant.

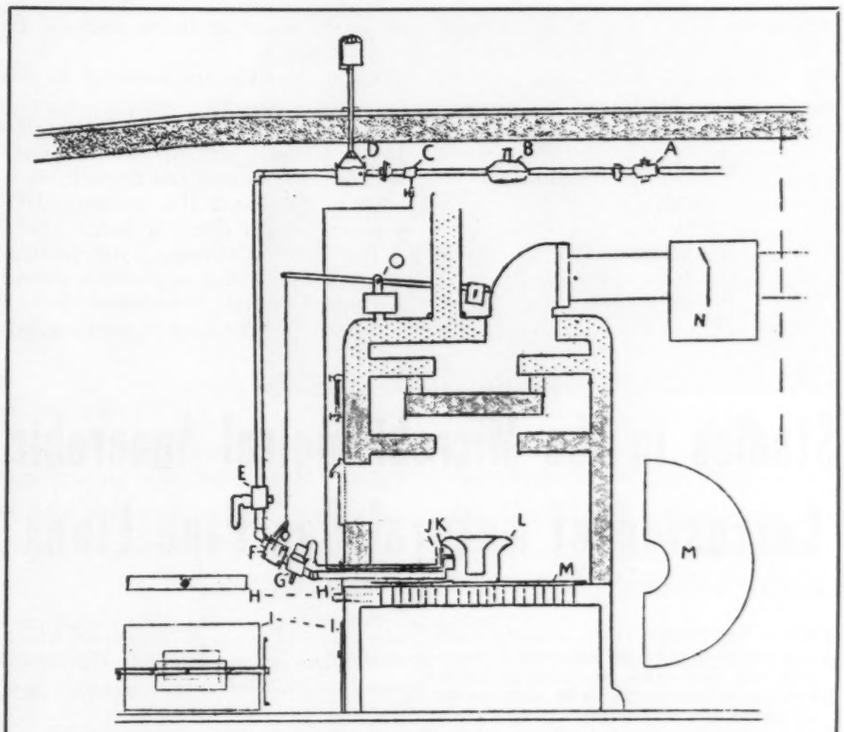
The effect, however, is to provide the small house owner with gas to cost:

First	1600 cu. ft.	$2.80
Next	1400 cu. ft. at	.08
Next	3000 cu. ft. at	.05
Above	6000 cu. ft. at	.045

The low-priced equipment problem did not offer much opportunity for choice. A person could heat his home with oil for $60, and he could buy an oil burner for $69.50 with free directions on how to install it.

While the market offered little by way of low-priced gas burner equipment, it did offer enough that could be fabricated to try a long-wished-for experiment.

The equipment merely consists of a sturdily built luminous flame burner with Baltimore pilot, and a sylphon-type graduating thermostat. This equipment can be installed with special flue diverter, special secondary air control and safety controls for $99.50 and provide a small margin. For safety controls, we use for steam a simple weighted throttle valve connected by chain to the existing sylphon draft controller. For hot water, we use an immersion-type thermostat — eliminating all electrical contraptions, which makes for a gas man's holiday.



A. Gas cock
B. Governor
C. Pilot tee
D. Control
E. L.H. gas cock
F. Limit control
G. Pilotstat
H. Clinker door plate
I. Ash pit door plate
J. Pilotstat tip
K. Pilot
L. Burner
M. Grate plate (2 pieces)
N. A.G.A. diverter
O. Steam sylphon

FIG. 1. Typical installation diagram of burner and accessory equipment.

A Low Priced Conversion Burner

We chose the mechanical thermostat with intent, for it provides a heating feature always wished for — that is, modulated fuel consumption, straight line temperatures, and the absence of stratification. No finer heating service has ever been provided.

The installation procedure is most simple. A typical diagram is shown in Fig. 1. The gas supply line from the meter, first equipped with a governor, passes under the room (usually the living room) in which the thermostat is to be located, the thermo valve is cut in, and the extension rod is passed up through the floor, with the control head in the room in some inconspicuous though convenient place. A pilot tee is placed between the governor and the thermo valve. The line continues to the burner and includes the limit control and the pilotstat. The burner rests on an air control plate which, in turn, rests on the furnace grate.

A draft diverter is used in the flue line. Inserted in the ash pit door opening is an air control device, made of sheet metal with a slotted air shutter which controls the amount of entering air for combustion, while the grate plate controls its direction.

The burner may be procured to provide various capacities up to 250,000 B.t.u. indicating that its application is not confined to the miniature house. The by-pass or minimum flame should be about 5% of the maximum consumption.

The installation routine is as follows:

1. Thoroughly clean boiler.
2. Cover grates with two-piece plate of sheet metal full diameter of firepot with 6½-in. hole in center.
3. Install burner in center of firepot with bottom at grate level. Leave grates in place.
4. Install governor in accessible place.
5. Install pilot tee between governor and thermostat.
6. Install thermostat with dial approximately 14 in. from floor.
7. Connect according to diagram with gas lines and pilotstat tube enter-

ing through clinker door opening, through piece of sheet metal cut to fit.

8. Install A.G.A. diverter as close to chimney as possible.

9. Set thermostat by-pass at 5% of maximum as stated in instruction sheet. Set main burner consumption as per instruction sheet.

10. Light burner and check ignition and automatic cut off. See that gas burns without streaming.

11. Calibrate thermostat so burner is half on when head reads the same as thermometer in living room, 4 ft. from floor.

Limit controls are installed in the following manner:

Steam: Install control valve between pilotstat and orifice tee. Connect to sylphon with rod or chain. Balance to close at 2 lbs. pressure. Disconnect damper chain or rod.

Hot Water: Immerse water thermostat in boiler as far as possible, extend with pipe to make connection.

Warm Air: No limit control needed.

Studies in the Microbiological Anaerobic Corrosion of Natural Gas Pipe Lines

• SINCE THE EARLY 1920's, scientific literature has touched on the existence of organisms that may attack iron pipe buried in soil. These bacteria assertedly consume the protective film of hydrogen from the surface of the pipe and break down calcium sulphate into products which attack the pipe surface to form ferrous sulphide. Heretofore corrosion engineers in this country, at least, have been reluctant to attach much practical significance to this form of corrosion, but such evidence of its existence is becoming so apparent that this form of corrosion can no longer be disregarded. In a paper entitled "Studies in Microbiological Anaerobic Corrosion," presented before the 17th Annual Distribution Conference held at Houston, Texas, May 7-9, 1940, RAYMOND HADLEY, Susquehanna Pipe Line Co., Philadelphia, Pa., gave a complete review of this subject. Short excerpts from and discussions following the presentation of this paper are herewith offered. — (Abstract by GAS.)

FROM the data presented in this paper, it may be concluded that:

1. The basic theory underlying the microbiological anaerobic corrosion process is in accordance with the more commonly accepted electrochemical theory of corrosion, the principal differences being the manner by which the cathodic hydrogen polarization is removed, and the mechanism causing the suppression of the ferrous ions.

2. One of the component salts of the products of corrosion is FeS, which can under the conditions stated, result only from the notabolic activity of the sulphate-reducing bacteria and may therefore be taken as a definite indication of bacterial corrosion, if found in the corrosion products.

3. The prevalence of microbiological anaerobic corrosion, as shown by numerical data obtained from pipe lines in certain eastern states, is astonishingly common and is sufficient to account for a large quantity of the corrosion of the pipe lines from which these data were obtained. (Lines located in Pennsylvania, Ohio and New York.)

4. Pit distribution curves show that for similar locations, geographically very close together, the pit depths where bacterial corrosion occurs are greater than pit depths found at locations where bacterial corrosion is absent.

5. Pits occurring in a pipe at a location where microbiological anaerobic corrosion is not present do not represent the same degree of hazard, as do the characteristic slabs of the same depths found in locations where the sulphate-reducing bacteria are active.

6. The microbiological anaerobic corrosion process is not a process of the "self-stifling" variety. The pit depth rate instead of decreasing with time, actually shows a pronounced increase with time in some locations where the sulphate-reducing bacteria are active.

7. The data available at the present time from American sources relative to microbiological anaerobic corrosion is sadly inadequate, and should be supplemented not only by additional data pertaining to the distribution of this corrosion, but also by methods with which it may be economically minimized.

Comments of Scott Ewing*

There is no question that the bacteria with which Mr. Hadley's paper is concerned are of very wide distribution. The National Bureau of Standards sent some soil samples, collected all over the country, to Mr. Bunker's laboratory in England and he found the bacteria in almost every sample.

Neither has there ever been any question as to where the most corrosive places occur on a pipe line, at least in the state of Ohio. The fact that the corrosion is severe in the low wet places can be explained by the electrochemical theory, but the theory has to be stretched a little to account for very severe corrosion in wet, neutral soil with high resistivity, especially when no long line currents were found on the pipe flowing toward the corroded section.

Since bacteria consume hydrogen and since cathodic protection increases the amount of hydrogen on the pipe surface, perhaps cathodic protection will help the bacteria to thrive around the pipe. There are also reasons to believe that cathodic protection will prevent bacterial corrosion. It is important that this question be definitely answered as soon as possible. This may be why cathodic protection does not always protect."

Comments of R. L. Starkey†

The sulfate-reducing bacteria are widely distributed and are able to develop or persist under diverse environmental conditions due to a considerable extent to their ability to utilize numerous substances as foods, to their tolerance to differences in salt concentration and temperature, and to their production of spores which enable them to persist during periods unfavorable for development.

Beijerinck, who first obtained the organisms, found them in ditch and canal muds and soil. Subsequently, they have been frequently recovered from these sources and also from the ocean, salt seas, sea muds and sand, dune sands, springs, sewage, brines of oil wells, and even from water at the bottom of gasoline storage tanks. Von Wolzogen Kuhr noted sulfate reduction in clay obtained from a depth of 71 meters.

The possibility is thus great that the organisms will be present wherever pipe lines are laid in soil, sands, marshes, peat bogs, and in the bottom material of water basins. If conditions are favorable for their development the probability is great that they will become active.

*A. G. A. Research Associate, National Bureau of Standards, Washington, D. C.

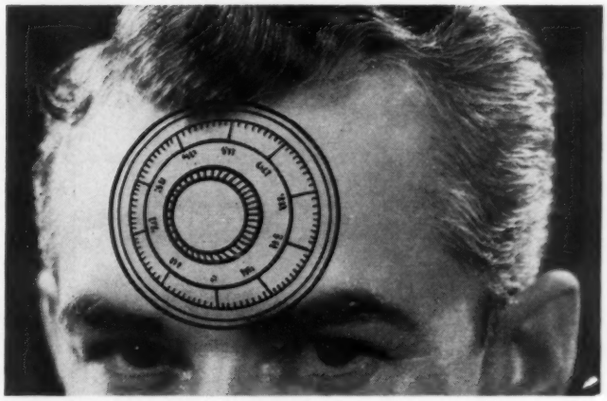
†New Jersey Agriculture Experiment Station, New Brunswick, N. J.

■ ■

Changeover in Minneapolis

The Minneapolis Gas Light Co., Minneapolis, Minn., was granted a new franchise and rate ordinance June 14, which allows the company to sell straight natural gas for industrial use and provides for changing over from mixed gas to natural gas for domestic purposes at a future date.

What Combination will unlock it?



Finding the right combination of ideas about floor furnaces to open up the minds of a few of you commercial managers is quite a trick.

But we're happy to say that the C.M. with a stern and rock-bound resistance to floor furnaces is gradually going the way of the dodo. Every heating season more utility executives turn to good floor furnaces as the practical way to put space heating with gas into thousands of homes.

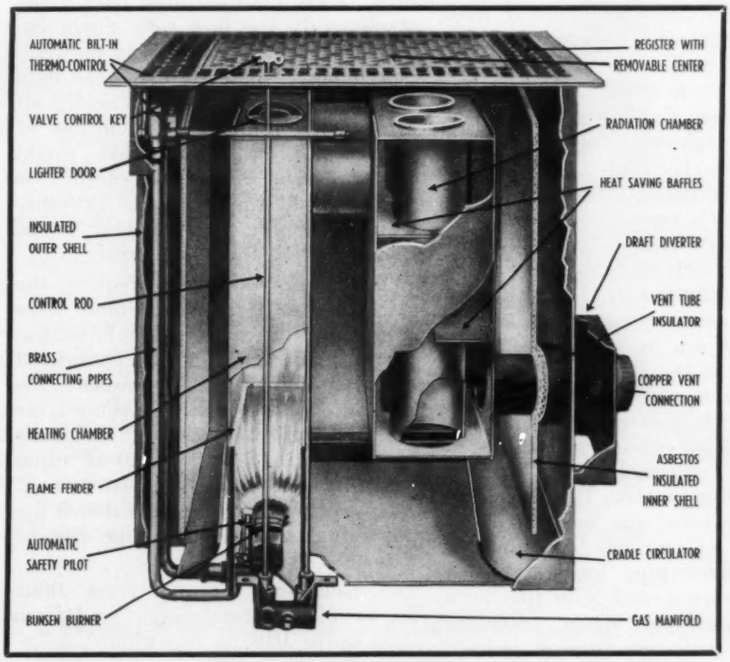
Once you *"get in on the ground floor"* with a WARD Floor Furnace you're there for good, because a WARD is *permanent* equipment that stays put.

Floor furnaces will do a whole ground floor heating job through installation of two or more units. In areas where conditions prevent use of basements for major plants, the floor furnace solves the problem. No installation difficulties. Just drop furnace into floor opening, attach to vent and gas line and *the home is yours.*

For many medium and lower income homes, where first cost is a problem, a floor furnace will get you in. Additional installations later spread the advantage of gas heat to the entire house.

In homes equipped with major plants, the floor furnace is ideal *auxiliary* heat for early fall and late spring. Also as *supplementary* heat for heat for special rooms or difficult-to-heat areas.

Why not give us a chance to help you open up this new source of revenue, profit and service. Have a look at our latest catalog. A copy is yours for the asking.



Hugo F. Reichel

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31 YEARS . . . 62 MODELS

For 31 years WARD FLOOR FURNACES have grown in importance in the merchandising programs of many utilities. Today we make floor furnaces *exclusively* . . . 62 models adaptable to a wide variety of heating requirements. WARD FLOOR FURNACES are *ten-year-guaranteed* appliances with a proven record of service. They will please your customers . . . and profit your company.

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Get in on the Ground Floor with

WARD

Floor Furnaces

YOUR LOAD IS AS GOOD AS THE APPLIANCE YOU SELL

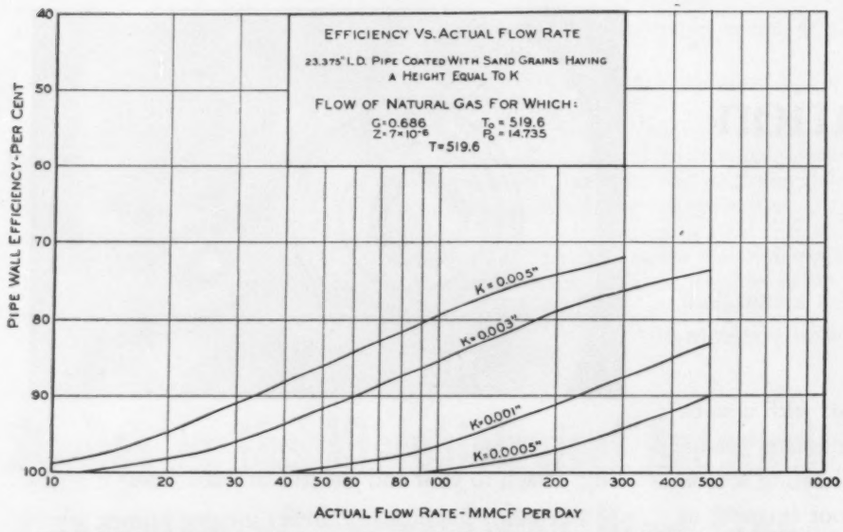


FIG. 1. Efficiency versus actual flow rate for 23.375-in. I. D. pipe coated with sand grains. G=specific gravity; Z=viscosity in lbs. per sec. ft.; T=flowing temperature, degrees Rankine; P=pressure measurement base, lbs. per sq. in. absolute; T=temperature measurement base, degrees Rankine.

The Effect of Pipe Line Roughness On the Flow of Natural Gas

• IT IS OBVIOUS that roughness of the interior of a pipe line will impede the flow of gas, not only by reduction of diameter but by increasing friction. And, while in the recent past several operations have been described wherein corrosion products have been removed from pipe lines with the result of improving gas deliveries, no quantitative evaluation has been presented on the effect of various spacing and depth of roughness or other minor irregularities. In a paper entitled "Flow of Natural Gas in Rough Pipes," presented at the Annual Convention of the A. G. A. Natural Gas Section, meeting at Houston, Texas, May 6-10, 1940, RAYMOND RANSOM, of the Panhandle Eastern Pipe Line Co., New York, N. Y., reviews the literature developed on this general subject by other industries and presents data that should be of considerable interest to gas transmission engineers.—(Abstract by GAS.)

THE interior walls of present day commercial gas line pipe are both rough and wavy. Sometimes the degree of roughness is further increased due to corrosion or incrustation before as well as during use. Consequently, in order to better understand the design and operation of pipe lines we should investigate the flow of natural gas in these rough pipes.

Many experiments were conducted on the flow of fluids through pipes and channels whose walls had been artificially roughened. While the range of flow conditions in early experiments was not great, they appear to have established that:

1. The principle of dynamic similarity applies to the flow of fluids through rough pipes.

2. So long as the fluid flow is viscous, the character of the pipe wall has no effect on the flow.

3. For pipes with wavy walls the coefficient of friction is equal to the coefficient of friction for smooth pipe times a factor which usually has a value between 1.0 and 2.0.

4. The coefficient of friction of a rough pipe reaches a constant value with increase of the Reynolds' Number and that this constant value depends on the degree and nature of the roughness.

Nikuradse (1933) (see English translation in *Petroleum Engineer*, March 1940) coated the walls of 1 in., 2 in., and 4 in. pipe with carefully sized sand grains. Using water as the fluid, he conducted flow tests at Reynolds' Numbers as high as one million. In all, tests were conducted using six different relative roughnesses, r/k (r= inside radius of pipe, k= height of roughness element).

Fig. 1 has been prepared for the purpose of illustrating the significance of Nikuradse's equations in terms of the effect on efficiency, of an otherwise perfect 24 in. pipe line, of a coating of different sized sand grains.

Another use of a curve such as Fig. 1 will be shown by a practical problem. Flow tests made in 1937 and 1938 on some of the 24 in. lines in the Panhandle Eastern Pipe Line Co. system revealed efficiencies as low as 72% with efficiencies of 75% to 80% not uncommon. The flow rate during the tests was usually about 110,000 M c.f. per day. Examination of the interior pipe walls disclosed that they were coated with fine sand to a thickness of about 0.005 in. (measured with micrometer gage). Sieve analyses, made later, indicated that the sand might be slightly larger than 0.005 in. A strip 8 in. to 10 in. wide at the bottom of the pipe was not coated at all. The problem is not that of making a fine calculation of the effect of the sand but only that of determining if it is reasonable to attribute the low observed efficiency to its presence.

For sand grains 0.005 in. in diameter and a flow rate of 110,000 M c.f. the efficiency of the pipe wall, obtained from Fig. 1 is 78%. If the losses due to other causes amount to 5%, then the expected line efficiency would be 78 x .95 = 74%.

All commercial pipe is rough in the physical sense. Questions naturally arise as to the degree of the roughness and its effect on efficiency. Most of the flow tests on large natural gas lines so far reported have been made at relatively low flow rates either because they were made during the summer months when the load was light or due to other causes. Practically all of such tests indicate that the loss of efficiency is not more than might reasonably be due to causes such as joints, bends and fittings. In other words the pipe walls appear to be smooth in the hydraulic sense.

The large pipe lines require the smoothest walls and it is these lines which are the most difficult to test in the field. Thus, it was considered desirable to physically measure the roughness of the walls of some large diameter pipe. Profiles of the walls of electric-weld and seamless pipes were obtained from four samples of each, with the following results. It appears that the seamless pipe can be described as having:

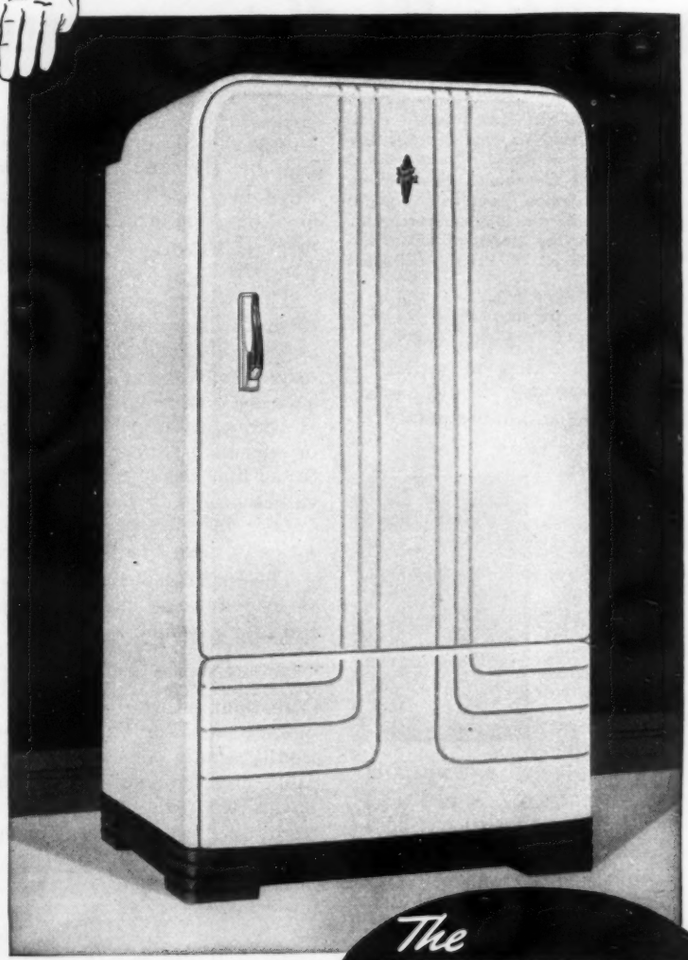
1. Roughness ranging from .0001 in. to .001 in. total height and from .002 in. to .010 in. in width.

2. Waves on dimensional changes ranging from .001 in. to .004 in. total height and from .020 in. to .100 in. apart.

While the electric-weld pipe has:

1. Roughness ranging from .00005 in. to .0005 in. in height and from .001 in. to .010 in. in width.

WHAT'S A CUSTOMER WORTH?



There's more than Merchandising Profit for you in Promoting the Sale of Gas Refrigeration

ANY CUSTOMER on your lines is worth more to you than the gas he buys. In the first place, he's worth fighting to *keep,* for losing a present customer is worse than not gaining a new one.

Selling Gas Refrigeration to your standing accounts will protect your present gas cooking load.

But more positive benefits result, too. Learning a new use for gas, customers tend to investigate others. They're led to house-heating and water-heating by gas, and buy the necessary appliances.

Equally important to the utility's business from a long-term point of view, they learn to regard gas as the modern fuel . . . help publicize the use of "Gas for All Four Jobs."

The figures indicate that more than a million families—most of them probably gas users now—are going to be replacing their old, worn-out mechanical refrigerators this year. As a result of past experience, they're going to be looking for the very advantages which only Gas Refrigeration can offer them.

The opportunity of putting Servel Electrolux in their homes must be taken advantage of today . . . or it may not occur again for many years.

GAS REFRIGERATION

★ Protects Your Present Load ★ Builds New Load without Increased Investment
★ Stimulates the Sale of Other Gas Appliances ★ Publicizes the Modernity of Gas
★ Promotes the Use of "Gas for All Four Jobs"

The **SERVEL** **ELECTROLUX** *Gas Refrigerator*

WINS GOOD WILL FOR GAS AND GAS SERVICE

2. Waves ranging from .0005 in. to .0013 in. total height and from .010 in. to .150 in. in width.

The problem involves questions with respect to the effect of (a) waves or dimensional changes, (b) roughness of the particular shape and (c) the particular spacing arrangement of the roughness projections.

Streeter (1935). (See Trans. Amer. Soc. Civil Engineers Vol. 101, 1936, p. 681) with water as the fluid, investigated the loss of head in artificially roughened 2 in. brass pipe. The roughness was produced by cutting spiral grooves in the pipe wall. The degree of roughness being altered by changing the depth, shape and pitch of the grooves. Streeter computed for each of these roughnesses the sand grain size which would, according to Nikuradse, produce the same resistance. The equivalent sand grain sizes varied for the different roughnesses from 0.34 to 4.6 times the depth of the grooves. The importance of the shape and spacing of roughness projections is evident from these measurements.

The International Standardization of Constriction-Flow Meters in Europe

• B. G. WILLIAMS, gas measurement engineer, Southern California Gas Co., Los Angeles, Calif., in a paper, "International Standardization on Constriction-flow Meters in European Countries," presented before the Southern California Meter Association, at its regular monthly meeting in Huntington Park, Calif., April 25, 1940. — (Abstract by GAS.)

DURING the past several years, scientists in several European countries had been working on a plan of fluid measurement that would be acceptable for international standardization.

B. G. WILLIAMS

In this work, they have tested the various types of measuring devices that employ a constricted flow. These include: orifice meters, venturi meters, and nozzles. After all, with this type of measurement, the accuracy depends on the coefficient, and basically the coefficient can be determined only by tests. So in their efforts to obtain perfection, they have made a great many tests. Not being satisfied with the so-called standard types of measurement, they have introduced new types of measurement and ideas which seem to give promise of a more successful solution of the measurement problem.

It is known that the irregularities mentioned in the coefficients are encountered during the measurement of fluids heavier than air, or with viscosities somewhat larger than the viscosity of air. No attempt is being made in this presentation to locate the exact point in viscosity at which the coefficients become irregular. It is known, however, that these discrepancies are found in the zone of low values of the Reynold's Number and for high values of expansion factors, in the measurement of water and steam by constriction-flow meters.

The irregularities caused by the Reynold's Number do not affect, to any appreciable extent, the measurement by orifice meters of gas lighter than air, such as our commercial natural gas. However, in the measurement of water or steam, by orifice meters, it was found that coefficients increase for low values of the Reynold's Number. The greater increase occurs in the larger ratios of orifice to pipe diameter.

The coefficients for a nozzle become smaller for the lower values of the Reynold's Number.

Double Orifice Meter

In their efforts to secure a type of measurement for which the coefficients would remain constant throughout the range of the Reynold's Number, experiments were directed toward a meter containing two orifices. In one group of these meters, the size of the two orifices remained constant, and the distance between them was increased step by step until the orifices were so far apart that the flow through the first orifice was not affected by the second orifice. In the other group of double orifice meters, the orifices were kept a constant distance apart and the size of the downstream orifice was enlarged little by little until it became too large to affect the flow through the first orifice.

The results of these tests showed that for all practical ratios of areas, the double orifice meter, when properly designed, will have coefficients that are constant down to definitely smaller values of the Reynold's Number than are possible with any single orifice.

Venturi Meters

Tests were made on the venturi meter with the discharge coefficients calculated first by using the expansion factors for the standard nozzle, and second, with the expansion factors for standard orifices. In both instances, coefficients were reasonably constant for low values of the Reynold's Number but became irregular for the higher values.

A meter was designed by using a standard nozzle as the inlet and the lower section of the Venturi tube as the outlet, or diffusor. Between the nozzle and the Venturi tube there was installed a cylindrical section.

With this meter it was necessary to determine by tests the proper relation of the various parts.

Tests were made to determine the effect of the length of the cylindrical ring, the length and the angle of the diffusor, and the location and width of the pressure taps.

Investigations thus far seem to indicate that this meter, if properly designed, will have a tolerance of $\pm$ 1.0 to 1.5% and will be more suitable for standardization than any of the meters heretofore mentioned.

The following are some of the points that have been brought out:

1. Because of high accuracy requirements, each metering device is calibrated individually.
2. Even though the orifice meters and nozzles have been standardized since 1930, the coefficient is not constant for all conditions. This means a change in the coefficient which is beyond an acceptable tolerance.
3. The commercial type of venturi tube was unsatisfactory. For high expansion factors, the coefficient was liable to sudden changes for high values of the Reynold's Number.
4. For measuring gas and steam with venturi tubes, the expansion factors are not known.
5. Coefficients for Venturi meters may be decidedly variable, and sometimes, ambiguous.

REFERENCES*

1. "The Discharge Coefficient of Standard Orifices and Their Dependence on the Length of the Edge," by Dr. Ing. G. Ruppel VDI, Berlin-Siemensstadt.
2. "The Double Orifice," by G. Walzholz, VDI, Kiel.
3. "Investigations for the Standardization of Venturi Tubes," by R. Witte, VDI, Ludwigshafen am Rhein.

*All of the above reports have been translated into English by Lyman M. Van der Pyl, of the Pittsburgh Equitable Meter Co.

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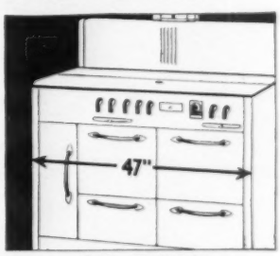
Huge Gas Well in Ohio

The Hope Natural Gas Co., Clarksburg, W. Va., recently brought in a gas well a mile and a half south of St. Joseph, Wetzel county, W. Va., gaging 7,770,000 ft. per day at 1050 lbs. rock pressure.

COMPACT FULL SIZE COMPACT WEDGEWOOD *Kitchen Heater Gas Range*

Model 6122 BK

USING SO LITTLE SPACE



Only 47" Wide

Wedgewood again brings you new modern styling with new high WEDGEWOOD quality . . . in the compact, yet full size, Kitchen Heater Gas Range. Although styled to economize on kitchen space, this lovely new Wedgewood model provides the full cooking capacity of much larger ranges.

Gas THE MODERN FUEL

WEDGEWOOD RANGES ARE FACTORY BUILT FOR ALL TYPES OF GAS

ADVANCED WEDGEWOOD FEATURES

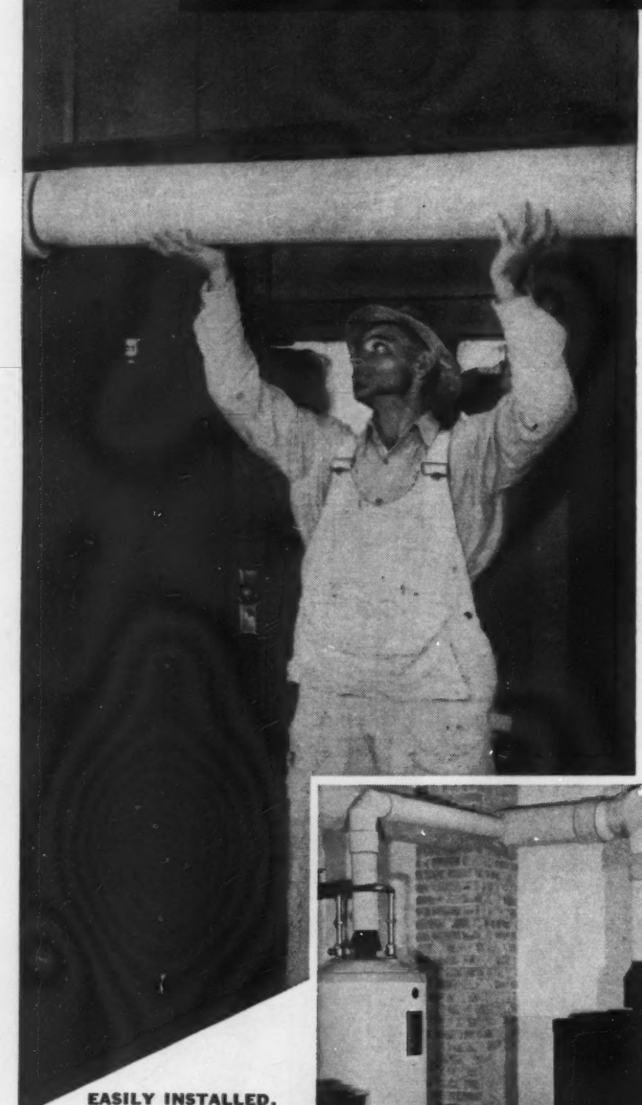
EXTRA-LARGE FIREBOX • HIGH-SPEED LOW-TEMPERATURE OVEN • DIVIDED TOP • TOP GRIDDLE AND WARMER • GIANT AND STANDARD SPEED-PLUS-SIMMER BURNERS • ASTOGRIL BROILER • ALL BURNERS SELF-LIGHTING

Extra Large Firebox

WEDGEWOOD THE MODERN GAS RANGE

JAMES GRAHAM MANUFACTURING CO. • Los Angeles - San Francisco - Newark, California - Portland, Oregon

CUT DOWN ON "CALL-BACKS" with this DURABLE VENT PIPE



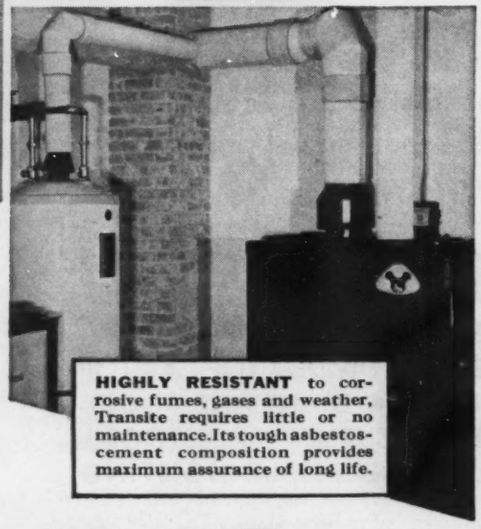
Made of asbestos and cement, unusually strong and durable, J-M Transite Flue Pipe provides maximum assurance of long life, low maintenance . . . helps keep customers sold on gas heating

FREQUENT CALL-BACKS for servicing flue pipe can be annoying to customers . . . may easily cut down your profit margin.

Make sure you install a lasting, dependable venting system by using J-M Transite Flue Pipe. This durable material is made of asbestos and cement . . . fireproof, rotproof, highly resistant to all forms of corrosion . . . helps keep customers sold on the dependability of heating by gas.

And because Transite is light in weight, easy to handle and comes in a complete range of sizes and fittings, installation is simple, rapid and economical. For details, write for brochure TR-13A. Johns-Manville, 22 East 40th Street, New York, N.Y.

EASILY INSTALLED, even in cramped working quarters, J-M Transite Flue Pipe helps speed up work . . . saves time and money on the job. A complete line of fittings, plus Transite's surprisingly light weight make installation fast, simple and economical.



HIGHLY RESISTANT to corrosive fumes, gases and weather, Transite requires little or no maintenance. Its tough asbestos-cement composition provides maximum assurance of long life.

AFTER TEN YEARS' exposure to weather outside, corrosive fumes inside, this J-M Transite Flue Pipe installation is still in excellent condition . . . requires no maintenance.

Johns-Manville TRANSITE FLUE PIPE

A.G.A.E.M.'s Policy Committee holds a luncheon meeting.

Manufacturers Probe Problems as Fifth Annual Meeting Is Held in Indiana

THE Association of Gas Appliance and Equipment Manufacturers held its fifth annual convention in French Lick Springs, Ind., May 20-22 with an attendance greater than that of any previous convention.

No "outside" speakers were included on the program and discussions centered exclusively around issues vital to the gas appliance industry in particular and the gas industry in general. Much emphasis was given to the extensive progress made by gas appliance manufacturers during recent years and there was expressed by the speakers a general optimistic outlook for the future.

Frank H. Adams, president of the association and vice president of the Surface Combustion Corp. of Toledo, Ohio, opened the convention at a luncheon reception on Monday, May 20. In his address of welcome, Mr. Adams said that associations formed, to a great extent, a bulwark for industry. He declared: "I think we can say it is almost fundamental that no single company can make money or have any real security profit-wise unless the industry as a whole is making money."

The principal session of the convention was held on the second day with Mr. Adams presiding. The speakers were N. T. Sellman, assistant vice president, Consolidated Edison Co. of New York; Louis Ruthenburg, president of Servel, Inc., Evansville, Ind., and W. C. Beckjord, president of the American Gas Association.

Mr. Sellman declared that the gas industry stands out from other industries in that it polices itself. He said that the gas appliance manufacturers and utilities have in the American Gas Association's Laboratory structure a means of self-regulation in all utilization matters that should preclude all necessity for outside interference.

Picking up the marbles at French Lick. LEFT: John Robertshaw, Robertshaw Thermostat Co. RIGHT: W. E. Derwent, George D. Roper Corp.

Speaking on "Industrial Relations," Mr. Ruthenburg said that higher wages, shorter hours and production restrictions without increases in efficiency will reduce American living standards. He stated that economic and social improvement in the United States can be continued only in the degree to which the "real" wage of the common man can be increased.

Mr. Beckjord said that the gas industry needs to tell its story more dramatically and comprehensively to the American public, and the logical way is through increased localized newspaper advertising to supplement current national advertising. He asked for more showmanship in selling and stated that women must today be considered by industry as to their tastes and practical judgment. "Our chief problem is selling. If you cannot sell your product, the rest of the problems don't count," he said.

At an informal session during the convention, George E. Frazer, of Chicago, counsel for the Association of Gas Appliance and Equipment Manufacturers, said that few American dollars will be invested in munitions for export, and a hundred times more American dollars are being spent right now in "new rugs for the sitting room; in new ranges for the kitchen, and in new furnaces and air-conditioning equipment for the home."

A far-reaching sales promotion program for CP gas ranges to extend into 1941 and 1942, as well as for the remainder of this year, was approved during the convention by the CP Sales Management Committee of the Association of Gas Appliance and Equipment Manufacturers. Lloyd C. Ginn, sales promotion manager, American Stove Co., Cleveland, was chairman of that committee.

An important phase of the convention was the series of divisional meetings held on the afternoon of the second day. Promotional plans for the sale of major gas appliances and equipment were discussed at that time.

The divisions and the chairmen were: Domestic Gas Range, W. E. Derwent, George D. Roper Corp., Rockford, Ill.; Gas Water Heater Division, L. R. Mendelson, Hotstream Heater Co., Cleveland; Gas House Heating and Air-Conditioning Equipment Division, W. L. Seelbach, The Forest City Foundries Co., Cleveland; Direct Heating Equipment Division, E. C. Adams, Adams Brothers Manufacturing Co., Pittsburgh; Gas Valve and Fittings Division, R. L. O'Brien, Detroit Brass and Malleable Works, Detroit; Thermostatic Control and Accessories Division, W. A. Lean, The Wilcolator Co., Newark, N. J., and the Industrial Gas Equipment Division, F. J. Fieser, of Fieser-Lundt, Inc., New York.

SALES Slants

Let's Make It Clear

YOU are a salesman who reads — perhaps studies. That you are reading this makes that obvious.

However, before going any further with this feature, let us understand each other beyond doubt; let us make one point clear.

The point concerns reading supplementary sales material such as is contained in this feature. No book or article that was ever written on the subject of salesmanship or on any other subject for that matter can make you a salesman.

But — and here is the point — it can equip you to become one; or being one already, it can qualify you to become a better one.

A baby is born with all the faculties and even more than he will ever need to master the language spoken around him. But as a child he will never speak accurately or fluently until he has learned something of the rules and basic principles — unless of course he happens to be that rare individual we call a genius. He will learn to make himself understood. Yes! But only after a long time and after endless trial and error.

The articles contained in this feature are designed to touch upon the rules and basic principles of salesmanship which will help to make you a better gas appliance salesman. This page is edited by one man. But it is not the thoughts of one man! The thoughts are based, directly or indirectly, upon actual experiences of gas appliance salesmen everywhere. Our purpose is to present them to you interestingly. We hope you will profit from them!

Friends Mean Money

THESE days, friends have a cash value, particularly in the field of selling. And perhaps at no other time in the history of selling was this truth more widely accepted than now. And perhaps at no other time have books related to the subject of winning friends and influencing people been more widely circulated.

Have you read any of these books? The most amazing thing is that one single thought expressed in about ten words is the key to the entire subject matter. This key, plus common sense, is all that any intelligent person really needs to enlarge his circle of friends — and customers.

To make people like you, like them, sincerely and genuinely!

Simple, isn't it? Yet some of the would-be graduates of "winning friends and influencing people" have missed the point entirely. The next man who greets you over-enthusiastically and praises you to the point of flattery — put him down as having flunked his studies.

Traits of friendship, leadership and salesmanship can definitely be acquired. But the entire undertaking must be underlined with a genuine like for other people. At least, that's what the experts say and experience proves it.

Let your present gas appliance customers help you to get others. And regard your present customers as future prospects. If they are friends of yours, you can depend upon them!

You Never Know

ONCE an insurance company received an inquiry from a man who said, "I am interested." This man gave his age as 75.

The inquiry was handled in the routine way — it was sent along to one of the field men in the town where the "interested" person lived.

Now, anyone knows that a man 75 years old can't get insurance. The field man knew it and was quick to exclaim, "Do they think I'm going to waste my time following up a thing like that?" He didn't.

The inquiry was turned over to another man in the local office. He was "fool enough" to withhold opinions and conclusions until he had talked to the "old man."

The next morning he came in with a signed application and the first premium payment on a $10,000 policy. The "old man" was not interested in a policy for himself but for his son, and he bought for his son.

Perhaps it is a far-flung conjecture but interesting to contemplate . . . namely, how many sales are lost because the salesman considers the prospect with preconceived and inflexible ideas about his needs and wants, his ability to buy and his qualifications as a buyer?

But whatever the amount in dollars and cents, whether large or small, we are sure that all loss could be avoided by the common sense practice of *finding out* from the prospect's point of view.

Who would suppose that a family in a two-room shack on a side street would be a prospect for a $200 range? Such sales are made. We know of several examples!

It would be a mistake to conclude from this story that you are a poor salesman unless you canvass every shack in your town. Rather, think back to those prospects you passed up for no better reason than "Well, it just looks like a waste of time." Sometimes it pays to follow up a lead although it looks doubtful on its face!

One More Order Is Waiting

"SO much to do — so little time to do it in." Those were the words of a man with a dream — a dream of empire. He made of that dream a reality.

In the brief span of his life — a barely audible tick in the great clock of time — a large section of the southern tip of the great African continent became, under his willful direction, a thickly populated British province giving life, sustenance, security and wealth to millions.

That man was John Cecil Rhodes, empire builder. His vision was so great that he knew he could never live to see it realized. So, he worked feverishly to overcome the greater obstacles to his dream that others who followed might carry on.

Rhodes was typical of the great men the world has given us in that all have despaired of the few brief hours in a day. Almost every history of our geniuses closes with a statement of their unfinished works. Each one, as if with his eye on the clock and a preconceived knowledge of the time of his passing, worked feverishly to accomplish just one more thing.

Perhaps we ordinary mortals could not stand such pressure and drive. At least, we would be deprived of many of life's pleasures and joys if some time were not allotted for relaxation and recreation.

Yet, when realizing the energetic and determined effort of these great men, we should hang our heads in shame at the thought that out there is one more modern gas range, refrigerator, or automatic gas water heater order waiting for us if we give only a few minutes more to our day's work and go after it.

SALES CAMPAIGNS

Company: Alabama Gas Co., and Alabama Natural Gas Corp., Birmingham, Ala.

Campaign Theme: CP for President.

Description: In a recent gas range sales campaign, Mr. C. P. Range was elected president of the American kitchen. At the beginning of the campaign, salesmen attended a "nominating convention," at which the plans of the "Gas Party" were outlined. Having been nominated by the Gas Party, Mr. C. P. Range proposed that the party support Mr. N. C. P. Range as vice president, Mr. A. Water Heater as secretary of faucets, Mr. S. Electrolux as secretary of health, and Mr. F. Furnace as secretary of comfort. Electoral votes were obtained through appliance sales, points for each type of appliance having been established by sales managers.

Each week a sales bulletin, carrying election ballyhoo, was sent to the salesmen, giving results of the campaign to date. Employes of the branch of the Alabama Gas Co. at Anniston staged an additional contest in their own property by dividing into two teams, the "elephants" and the "mules." At the end of the campaign the losing team entertained the winners.

■ ■

Company: Virginia-Tennessee Division, Stone and Webster Service Corp., New York City.

Campaign Theme: Old Stove Blackout Glorified.

Description: During this range sale which extended over a period of six weeks, 552 gas ranges were sold. The Roanoke (Va.) Gas Co. promoted the drive by a window display portraying the "blackout" of the old gas range. The entire enclosure was painted jet black, and in the center of the window was placed a new white CP range on a raised platform. Lights were arranged to flick on for an instant at intervals, revealing the outlines of an old fashioned stove drawn on a fine screen placed in the background. When the lights were off, the old stove was "blacked out."

■ ■

Company: The People's Gas Light & Coke Co., Chicago, Ill.

Campaign Theme: Modern Gas Cookery Weeks.

Description: Organized through the cooperation of The Peoples Gas Light & Coke Co., gas range manufacturers, neighborhood newspapers and gas range dealers, this advertising and sales promotion began late in April and continued into the latter part of May. Prize contests, in the nature of a simple puzzle solution combined with the writing of a 50-word statement on the subject of "Why the Modern Gas Range Is Best for All Cooking Purposes," were sponsored by the company. Contest blanks were distributed by gas range dealers and the campaign was announced through posters and special editions of the local newspapers. Cooking schools were staged in neighborhood motion picture houses, and a city-wide show window contest was conducted to stimulate rivalry among gas range dealers.

■ ■

Company: Houston (Texas) Natural Gas System.

Campaign Theme: Cooler performance of gas ranges.

Description: This gas range campaign, running from April 18 to May 31, was conducted by 67 dealers. Portfolios explaining the campaign, outlining the schedule of activity, and proofs of newspaper advertisements to appear were sent to the dealers in advance.

The A.G.A. folder "Here They Come!" was mailed to 8000 prospects the first day of the campaign, and at the same time the first newspaper advertisement appeared. In the advertising copy, CP was explained to mean "cooler performance."

■ ■

Company: Pacific Gas & Electric Co., San Francisco, Calif.

Campaign Theme: Summer Gas Heating Campaign.

Description: This contest offers a 10% discount on a "buy now — pay later" plan to stimulate summer heating sales and runs from June 1 to August 31. The Pacific Gas & Electric Co. offers cooperative advertising to all gas heating dealers in its territory and gives them a chance to secure advertising at bargain prices. The schedule features display cards, newspaper advertising, billboards, bumper strips, bill-stickers and blotters. The Gas Appliance Society is providing free mat and publicity service to tie in with the campaign.

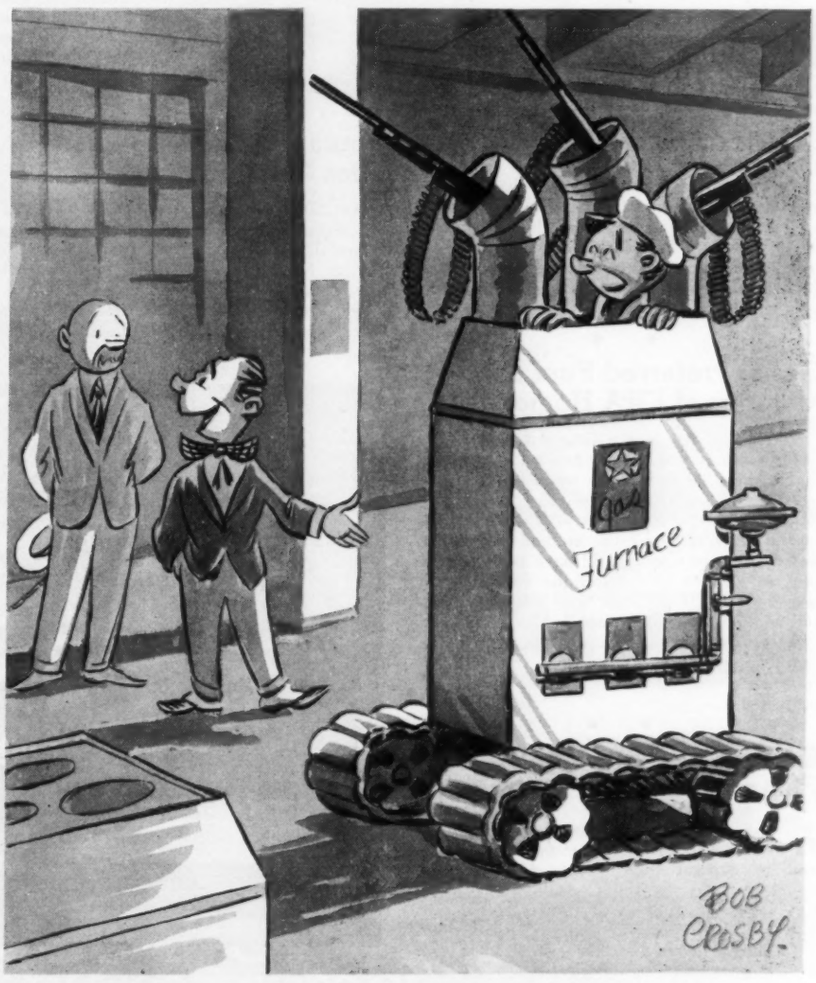
Annual Meeting of Ad Men Held In Chicago In June

THE 1940 convention of the Public Utilities Advertising Association was held in the Palmer House, Chicago, June 23-26, in conjunction with the 36th annual convention of the Advertising Federation of America. Clayton G. Cassidy of The Peoples Gas Light & Coke Co., Chicago, was chairman of the arrangements committee for the convention.

Keith Hartzell, president of the Association, presided at the sessions. Response to the address of welcome was given by Al C. Joy, advertising manager, Pacific Gas & Electric Co., San Francisco. Other gas industry executives featured on the program were: Gaylord B. Buck, vice president, Public Service Company of Colorado, Denver; Dale Remington, advertising manager, Wisconsin Public Service Co., Green Bay, Wis.; Wilmot Squier, advertising manager of Washington (D. C.) Gas Light Co.; and Howard F. Weeks, assistant director of the editorial bureau, Consolidated Edison Co., New York.

Thomas H. Spain, advertising manager, Public Service Electric & Gas Co., Newark, N. J., announced Copy Contest winners.

DOTTED LINE ROSCOE.... By Bob Crosby



"You see, Mr. Knudsen, our furnace department is cooperating with the national defense program."

Some of the 84 CP gas ranges going into the Ocean Parkway, Brooklyn, N.Y., apartment house. Shown (left to right) are: Leonard Genz, apartment house supervisor; Isadore Lehrer, president of Caton Park Estates; and range salesman Jerome Tunney.

New York Apartment Buys Eighty-four CP Ranges

NEW CP gas ranges have been installed recently in each of the 84 kitchens in the Ocean Parkway apartment house, Brooklyn, N. Y. This is the first apartment house in the country to be completely equipped with CP gas ranges, it was announced by Leonard F. Genz, apartment house sales supervisor of the Brooklyn Union Gas Co.

Jerome Tunney, of the Brooklyn Union company, sold the 84 CP ranges and 84 Servel Electrolux refrigerators to the apartment house builders, the Caton Park Estates, who have selected gas for cooking and refrigeration for the eight apartment buildings they have constructed since 1927.

■ ■

Gas Is Preferred Fuel In Majority of FHA Homes

Of the 292 U. S. Housing Authority projects contemplated, decisions on the cooking fuel to be used have been made in 225 projects. Of these, 179 will be gas, it has been reported by the American Gas Association. In 150 projects where the method of heating water has been decided, 82 have been turned over to gas. In specifying the fuel for the laundry in 179 projects, gas won out with 140 installations. Gas space heating has been specified in 87 of the 166 projects which have decided the heating question and gas refrigeration will be installed in 33 out of 171 projects.

■ ■

Commercial Appliances Now Financed by Gas Utility

A NEW plan to help New York City business and industrial concerns to modernize and to expand their plants is being announced today by the Consolidated Edison Company of New York, Inc., according to E. F. Jeffe, vice president in charge of sales. The plan involves new low-cost financing on a three-year basis for the purchase of gas and electric machinery and equipment needed for commercial modernization and expansion programs.

This campaign to help business and industry in New York City is being launched to increase the business and production facilities of the city, as well as to create additional jobs for men, Mr. Jeffe said. This is the first time that industrial and commercial establishments have been able to purchase this type of equipment on a three-year finance plan. All types of gas equipment are included.

The company will use the metropolitan newspapers and other advertising media, including direct mail, radio, etc., in promoting this new plan.

■ ■

Radio Shows Featured at Gas Wonderland Exhibit

A complete radio broadcasting station presenting daily programs began operations during the week of June 10 at the New York World's Fair.

The studio is located in the air-conditioned theatre of "Gas Wonderland" and is a joint project of the New York Broadcasting System and Gas Exhibits, Inc., the non-profit organization of the national gas industry conducting the industry's exhibit at the fair.

The public is admitted to the daily programs, according to the announcement made by Hugh H. Cuthrell, president of Gas Exhibits, Inc., and vice president of the Brooklyn Union Gas Co. The daily program consists of regularly scheduled music, a serial program, and talks. The "man in the street" style broadcast, where the announcer goes through the audience with a microphone for his material, is also featured from the Gas Exhibits' auditorium, located in the "Court of Flame" building.

■ ■

Montana-Dakota Utilities Sales Meeting Scheduled

Over 200 are expected to attend the ninth annual general sales meeting of the Montana-Dakota Utilities Co., Minneapolis, at Rapid City, S. D., August 19, 20, 21, according to E. B. Voneman, of the Montana-Dakota company. Nineteen states will be represented from New York State to California.

Boston Consolidated Gas Co. Opens Modern Miracle House

THE "Modern Miracle House," proposed and supervised by Gerald Higgins, manager of the advertising department, Boston (Mass.) Consolidated Gas Co., was opened the early part of May. The house is a Brooks-Skinner portable structure with some modifications and comprises a kitchen and adjoining basement. Two sides of it are cut away and the house itself is built right up to the showroom windows of the gas company, with the result that pedestrians and automobile traffic get a full view into the brilliantly-lighted interior. A home service girl is regularly on duty.

The kitchen is done in bright reds, gray and silver wallpaper and chrome fixtures, with a large section of glass blocks above the sink and CP range. The basement contains an automatic gas house heater and water heater (see cut). The architectural and contract work was carried out by Robert F. Pierce of the kitchen planning service department and the color and decoration by Harold Gleason, manager of the display department.

■ ■

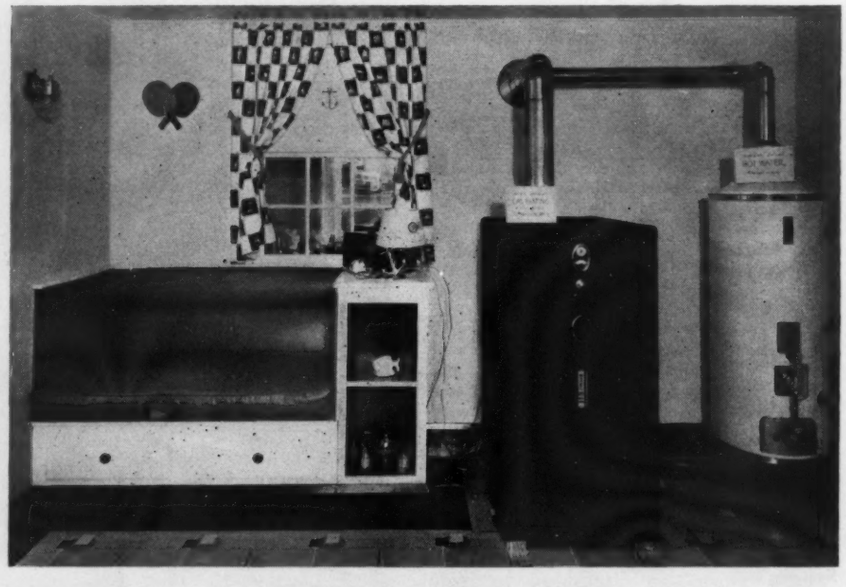
Plan to Sell Appliances Issued in Booklet Form

The Sales Development Committee of the New England Gas Association has issued a 56-page booklet covering "389 Gas Appliance Selling Features." It gives many advantages of the use of gas, among which are 124 listings for gas cooking, 88 advantages of refrigeration, 78 advantages of water heating, 43 advantages of gas kitchen heating, and 56 advantages of house heating. The committee is headed by J. J. Quinn, general sales manager of the Boston Consolidated Gas Co.

■ ■

Gas Plant Engineer Dies

Edwin A. MacGillivray, 74, engineer and builder of the first gas plants in Southern California towns, as well as in Central America and Southwestern United States, died recently in Los Angeles.



Boston Consolidated Gas Company's "Modern Miracle House" boasts a livable basement finished in blue and white in nautical manner. Gas house heating and gas water heating are much in evidence.

Modern Beauty

FOR YOUR FALL LOAD-BUILDING CAMPAIGN

★

Women demand beauty in all furnishings they buy for their homes. These popular 400 series Radiantfires are authentic modern designs whose good taste wins instant approval.

★

HUMPHREY Radiantfire

TRADE MARK REG. U. S. PAT. OFF.

This Fall, more than ever before, it will pay you to tie your load-building campaign around the modern beauty and modern low prices of Humphrey Radiantfires. Send today for our latest bulletin and cooperative selling material. It will help make your Fall Selling Campaign doubly effective.

GENERAL GAS LIGHT COMPANY

KALAMAZOO, MICHIGAN

23 Warren St., NEW YORK CITY 2nd Unit Santa Fe Bldg., DALLAS 475 Eleventh St., SAN FRANCISCO

THE VENTILATION OF MANHOLES

(Experiments with Ducts and Openings)

• **THE U. S. BUREAU OF MINES since 1936 has been studying the ventilation of manholes and has published the results in three Reports of Investigations: (1) "Effect of Holes in Covers on Natural Ventilation" (GAS, Nov., 1936, p. 24); (2) "Effect of the Size of the Manhole on Natural Ventilation" (GAS, Mar., 1938, p. 37); (3) "Effect of Wind Velocity on Natural Ventilation" (GAS, Dec., 1938, p. 23). A fourth study, "Ventilation of Manholes—Effect of Vertical Ducts in Combination with Openings in Manhole Covers on Natural Ventilation," has just been released by the Bureau. The authors are G. W. JONES, chemist, Explosives Division, Bureau of Mines, Pittsburgh, Pa.; W. E. MILLER, research assistant, cooperative employe; and JOHN CAMPBELL formerly superintendent, special service department, Boston Edison Co., Boston, Mass. The data herewith published was taken from Bureau of Mines Report of Investigations 3496.—(Abstract by GAS.)**

THE experimental manhole was provided with two 6-in. vertical ducts, one of which entered the manhole near the top and the other at the bottom. The tests were carried out in the same manner as in previous investigations dealing with this subject. The results showed that very low ventilation rates were obtained when only one duct (either upper or lower) was used. The air changes in these cases were less than four per day and therefore of limited use for ventilation purposes.

The results of tests made with ventilation ducts to determine their efficiency as ventilators when used by themselves and in combination with ventilated manhole covers are shown in Fig. 1. Poorest ventilation was obtained when one duct, either the upper or lower, was used with no openings in the cover. The air changes in these were fewer than four per day, which shows that one ventilation duct entering the manhole at either the top or bottom is practically useless for ventilation purposes.

However, when the lower duct was used in combination with openings in the manhole cover, much higher ventilation rates were obtained. For example, when the lower duct was used alone, only 2.3 air changes took place in the manhole per day; but when the duct was used in conjunction with a manhole cover having six openings, 20 air changes per day were obtained, an increase of something over eight times the previous amount of ventilation. Using a combination of lower duct and ventilated manhole cover, the ventilation was found to be roughly proportional to the number of openings in the cover. A cover having 48 openings and used in conjunction with the lower duct gave about 60 times as much ventilation as was obtained when the duct was used alone.

When the upper and lower ducts were used in conjunction with a solid, nonventilated cover, 92.1 air changes were obtained. This test stresses the necessity and importance of having two ducts in every manhole — one that enters near the bottom and the other near the top — to obtain good aeration. The use of two ducts situated as stated above created air changes in the manhole of the order of 25 times the amount produced by one duct alone.

On the basis of these tests, it would appear that ventilation in manholes requiring it, where the expense of mechanical ventilation is not warranted, can be increased by the use of two ducts as described, or by a lower duct in combination with a manhole cover having 12 or more openings.

Tests previously reported have shown that if the area of ventilation openings per 100 cu. ft. of manhole space is the same, then the number of air changes is about the same irrespective of the size of the manhole, provided other factors that might alter or disturb the ventilation are constant. Since the tests given in this report were made in a manhole having a capacity of 166.7 cu. ft., to apply the data to larger or smaller manholes the area of the ventilation openings and ducts should be changed proportionately.

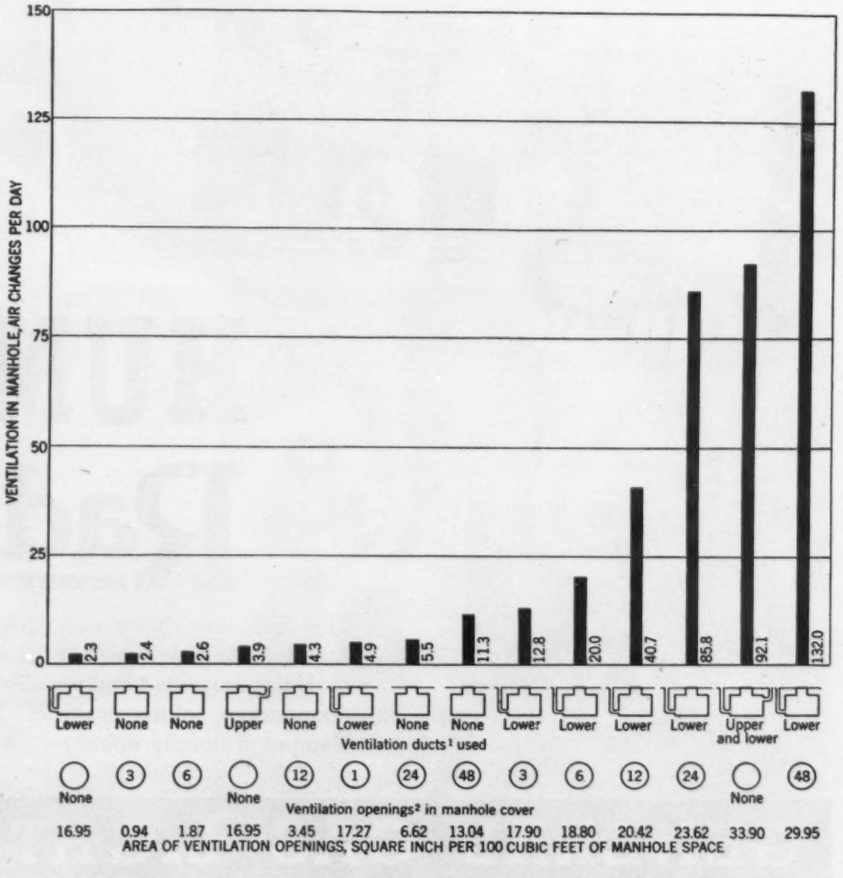


FIG. 1. Ventilaton of manholes; effect of vertical ducts and openings in the manhole cover on the natural ventilation. Capacity of manhole = 166.7 cu. ft.[1] Ventilation ducts 6 in. in diameter.[2] Six openings 0.812 in. in diameter, remaining openings 0.75 in.

Preview of coming campaigns by
P·G·and E·
PACIFIC GAS AND ELECTRIC COMPANY
GAS APPLIANCE SOCIETY OF NORTHERN CALIFORNIA
MODERN Gas APPLIANCES
QUICK CLEAN SAFE
ECONOMICAL
GAS APPLIANCE SOCIETY
OF CALIFORNIA
1940 SUMMER GAS HEATING CAMPAIGN
This month the 1940 Summer Gas Heating Campaign really starts rolling. First, our newspaper advertising, which began last month, will be backed up by outdoor advertising, bill stickers, truck banners and window displays—all featuring the special 10% campaign discount.
Second, we will continue to pay 1/3 of dealers' newspaper space costs—to supply dealers with free cuts—and to provide newspapers with photo and story material for special pages and sections of campaign advertising.
If you are a dealer or contractor handling gas heating equipment and doing business in P. G. and E. GAS territory, this is YOUR campaign. Make the most of it by tying in your advertising with ours. You can get plenty of ideas by talking with our office and with your local newspaper.
JUNE 1 to AUG. 31
G 207-740

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Gas Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Gas Appliance Society, 1355 Market Street, San Francisco, California.

Hugh W. Hartman, A.G.A. Assistant Manager, Dies

HUGH Wade Hartman, assistant manager of the American Gas Association and secretary of the Association's Accounting and Technical Sections, died suddenly June 8, of a heart attack at his home in Yonkers, N. Y. His age was 53.

Mr. Hartman was the oldest member of the Association's headquarters staff in point of service and his work with a national association serving the gas industry antedates the organization of the A. G. A. He was employed as assistant secretary of the old American Gas Institute, which in 1918 combined with the National Commercial Gas Association to form the A. G. A.

Educated in the public schools of Chicago and Kent College of Law, his first position was in the collection department of The Peoples Gas Light and Coke Co., Chicago, in 1906. In 1915 he was appointed assistant secretary of the American Gas Institute and in 1918 was appointed secretary of the Technical Section of the newly formed A. G. A. He was appointed secretary of the Accounting Section in 1919, then advanced to the position of assistant secretary-manager in 1925, retaining the duties of secretary of both the accounting and technical sections. Subsequently he assumed the additional duties of assistant manager of the Associtation.

■ ■

Indiana Cities May Have Gas With Higher B.t.u.

A petition was filed recently with the Indiana Public Service Commission by the Public Service Company of Indiana for approval of a schedule of rates applicable to gas of increased heating value to be supplied to New Albany, Jeffersonville, Claysburg, Clarksville, and adjacent territories. The gas now being supplied by the company to these municipalities has a heating value of approximately 570 B.t.u., and it is now proposed to increase this B.t.u. content to 900. The gas is obtained from the Louisville Gas & Electric Co., Louisville, Ky.

According to G. J. Oglebay, vice president of the Public Service Co., the aggregate annual savings resulting to the gas consumers if the petition is granted will be approximately $35,500 per year, or over 19% of the present revenues of the company from gas service in these municipalities.

■ ■

Bureau of Mines Offers Fellowship To Chemists

The Engineering School of the University of Pittsburgh, Pa., in cooperation with the Bureau of Mines, has offered a fellowship for research in the field of chemical engineering. The students selected receive $600 per year, remission of tuition fees, and become candidates for the degree of Doctor of Philosophy. About half the student's time will be spent in research work under the direction of the Bureau of Mines staff.

■ ■

Natural Gas Utilized For Building New Battleship

Approximately 40,000,000 cu. ft. of natural gas, supplied by the Brooklyn Union Gas Co., Brooklyn, N. Y., was used in the construction of the 35,000-ton, 750-ft. battleship *North Carolina* recently launched. The gas heat was required in shaping, annealing and tempering of metals. One of the operations was the annealing of the gun turret rings which consist of 10 sections and must be heated to a temperature of 1200° F., welded together and quickly annealed to prevent buckling. Another was the fabrication of piping systems which range from ⅛ in. to 3 ft. in diameter, and the making of hundreds of forgings.

■ ■

Indiana-Kentucky Gas Corp. To Serve Riley, Ind.

A NATURAL gas franchise was granted June 4, to the Indiana-Kentucky Natural Gas Corp., of Owensboro, Ky., by the people of Riley, Ind.

W. J. Hinchley, president of the company, stated that the laying of gas mains in Riley would be started within 10 days after the necessary permits have been obtained. The work of piping the town and installing service lines and meters, should be completed within a month to six weeks. The gas for Riley will be purchased from the Kentucky Natural Gas Corp., and obtained from that company's 12-in. transmission line running from a point near Terre Haute to Evansville, Ind. The rate proposed for the residents of Riley will be the same as is now charged for gas sold to rural customers of the company in Vigo county.

The company also has completed a pipe line to the nearby cities of Lawrenceville, Olney, Sumner and Bridgeport, Ill., and the 2500 gas consumers in those cities have been changed over from manufactured to straight natural gas. The company plans to make natural gas available to other cities and towns in the Terre Haute area during the coming summer.

■ ■

Citizens Gas and Coke Starts 25-Year Club

The Citizens Gas and Coke Utility, Indianapolis, Ind., held a banquet June 18, for their newly organized Quarter-Century Club. Each member was given a service emblem denoting his years of service and a printed parchment certificate honoring his record by Thomas L. Kemp, general manager.

The 53 members of the club have completed a total of 1644 years of service; representing 7% of the total daily average number of employes on the payroll in 1939.

California Utility Stages Exhibit at Orange Show

"BERTIE," the Southern California Gas Co.'s four-foot talking dummy, attracted several thousand persons to the company's booth at the 30th National Orange Show held recently in San Bernardino, Calif. The booth was 60 ft. wide, and contained new models of gas ranges, water heaters and refrigerators, as well as a display kitchen. (See cut.)

To attract attention to the exhibit, a gas radio, gas clock, and Bertie were displayed. Bertie, wearing formal evening clothes, moved his body and head and raised his arms automatically by means of levers hidden behind the rear wall of the booth. His conversation was produced through a two-way speaking device concealed in his chest. When the device was connected to his jaw, the speaking vibrations caused his jaw to open and close like a human speaker's.

H. C. McAllister, retired manager of the Eastern Division of Southern California Gas Co., recently served as president and chairman of various committees of the Orange Show. One of the Show's first presidents was C. M. Grow, formerly in the Southern California company's sales department.

■ ■

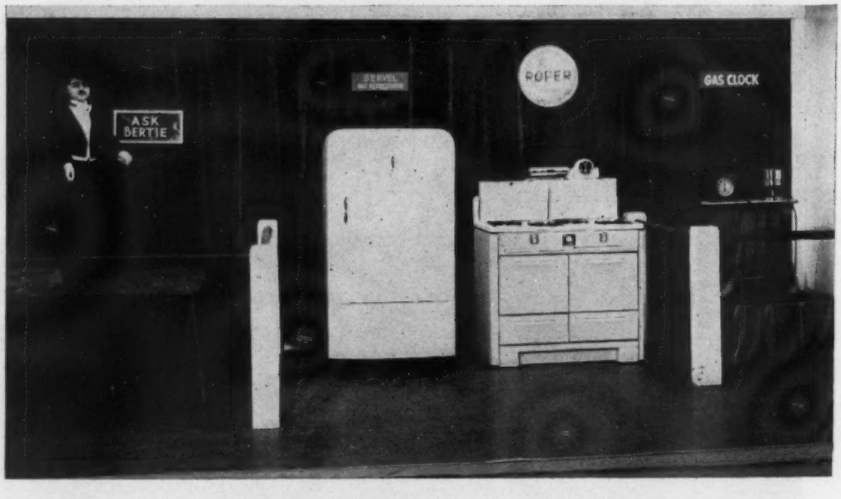
Canadian Gas and Petroleum Men Hold Annual Meeting

The Natural Gas and Petroleum Association of Canada held its seventeenth annual meeting at London, Ontario, May 30-31. Some of the speakers were: Earl Hodges, Cities Service Co., New York City, who spoke on the importance of public relations and how they may be improved; E. C. Steele, Union Gas Company of Canada, Ltd., Chatham, Ontario; and Victor A. Ogilvie, Gas Advisors Co., New York City. Mr. Ogilvie's address was on high pressure pipe line construction and was illustrated with motion pictures.

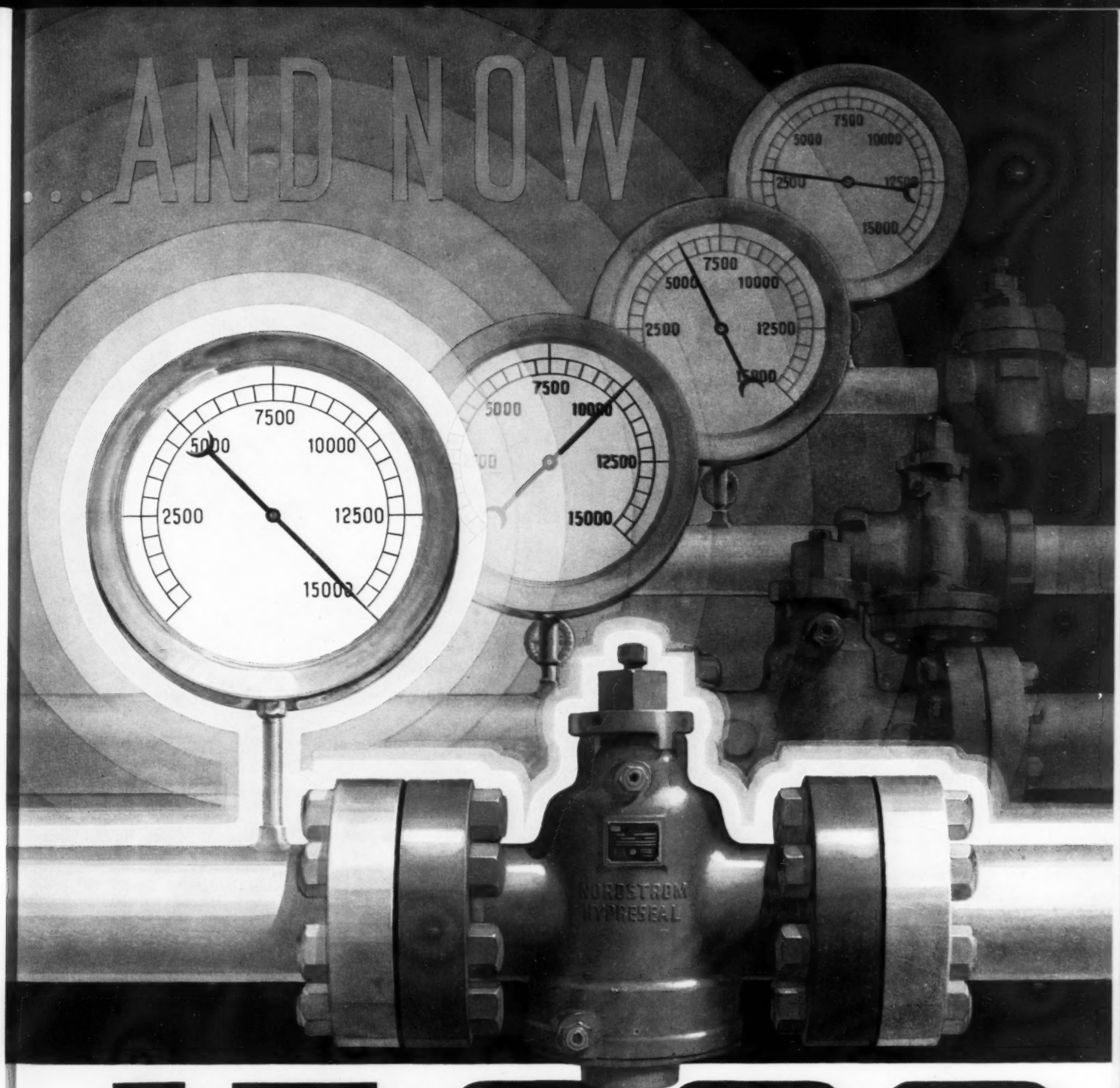
■ ■

Gas Co. Builds in Cadiz

The Natural Gas Co. of West Virginia is making plans for a new gas office and display room at Cadiz, Ohio. The building will have a 24-ft. frontage, and will provide room for display of gas fixtures and storage of materials for the maintenance of lines and equipment.



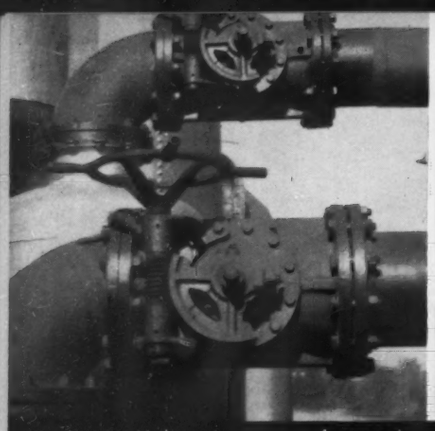
"Bertie," a talking dummy, attracted several thousand persons to the Southern California Gas Co.'s booth at the annual National Orange Show held at San Bernardino, Calif.



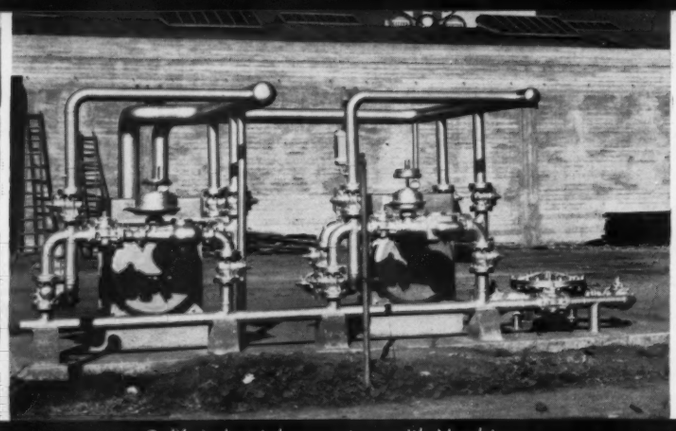
15,000
POUNDS' TEST PRESSURE

Fifteen years ago not even a Prophet would voice the suggestion of 15,000-lb. test pressures for valves. 3000-lb. tests then were the usual limit—and Nordstrom Lubricated Valves were available for this test. A few years later 6000-lb. test valves were needed—and *Nordstrom produced them.* Only two years ago 10,000-lb. test valves were demanded, principally for oil field drilling and production. Nordstrom, anticipating the need, met it immediately. Today, hundreds of these high pressure valves *(Hypreseal Type)* are in service, meeting a need no other type of valve can equal. And now comes a new giant of strength—the Nordstrom 15,000-lb. test valve, developed principally for recycling service in gas and oil fields, but available, if necessary, for any other excessive pressure service. Naturally, it's made of special alloy steel, with both plug and interior contact surfaces faced with Merchrome, the latest development in hard-facing.

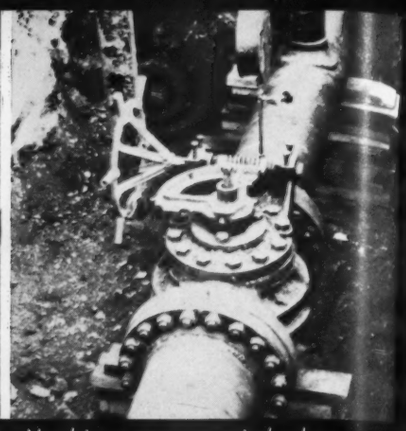
It's a Nordstrom



Nordstrom Valves in a manufactured gas plant on Long Island, New York.



Calif. industrial gas set-up with Nordstrom valves, EMCO meters and EMCO regulators.



Nordstrom gear-operated valves on gas pipe line in Mississippi.

KEEP UPKEEP DOWN
—the Nordstrom way

FOR ALL GAS SERVICES

Unaccounted-for gas is greatly reduced by the use of Nordstroms. The hazard of leaks is eliminated. No matter how infrequently a Nordstrom is operated it will always close or open instantly. They are as essential on low pressure city service lines as for main transmission lines. In combination with EMCO Meters and EMCO Regulators, they make the ideal set-up. On feeder lines, in control pits, on industrial burner lines, Nordstroms are the safest installation. Nothing will serve like a Nordstrom.

THESE ADVANTAGES SPELL ECONOMY

QUARTER TURN
Quickest to operate; easiest to see valve position.

SIMPLEST DESIGN
Fewest parts. Nothing to clog or trap line contents.

NO BLOW-OUTS
No channeling. Internal leakage precluded.

"SEALDPORT" LUBRICATION
Plug lifts by positive pressure. Ports always sealed.

FULL FLOATING PLUGS
Always easy to turn. Non-freezing. Non-seizing.

LAPPED PLUGS
Lapped by exclusive processes for precision fit.

NO EXPOSED SEAT
Plug rides on sealed pressure lubricant seat.

NON-STICKING
Powerful hydraulic action lifts and frees plug.

COMPACT
No protruding stems or yokes. Occupy least space.

CHECK VALVES
Two or more positive-acting checks in shanks.

SPECIAL LUBRICANTS
Highly developed plastic lubricants for all services.

Nordstrom
LUBRICATED VALVES

Sealdport Lubrication

MERCO NORDSTROM VALVE COMPANY—*a Subsidiary of* Pittsburgh Equitable Meter Company

WORLD'S LARGEST MANUFACTURERS OF LUBRICATED PLUG VALVES; GASOLINE, OIL & GREASE METERS

Main Offices: 400 Lexington Ave., Pittsburgh, Penna.

BRANCHES: New York City, Buffalo, Philadelphia, Columbia, Memphis, Chicago, Kansas City, Des Moines, Tulsa, Houston, Los Angeles, Oakland.

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PRODUCTS: Nordstrom Lubricated Valves; Air, Curb and Meter Cocks • Nordstrom Valve Lubricants • EMCO Gas Meters • EMCO-McGaughy Integrators EMCO Regulators • Pittsburgh Meters for Gasoline, Grease, Oil, Water and other Liquids • Raybould Couplings • Stupakoff Bottom Hole Gauges

Gas Utility Revenues Gain For First Quarter of 1940

MANUFACTURED and natural gas utility revenues amounted to $271,625,400 for the first three months of 1940, as compared with $246,812,800 for the corresponding period of 1939, an increase of 10.1%, it was announced recently by Paul Ryan, chief statistician of the American Gas Association, New York, N. Y.

The manufactured gas industry reported revenues of $104,932,500 for the first quarter, an increase of 6.6% from the same period of the preceding year. The natural gas utilities reported revenues of $166,692,900, or 12.3% more than for the first three months of 1939.

Total sales of manufactured gas for the first quarter were 111,700,700,000 cu. ft., an increase of 11.0%. Natural gas utility sales for the period amounted to 444,499,500,000 cu. ft., an increase of 12.4%.

Manufactured gas sales for domestic uses, such as cooking, water heating, refrigeration, etc., were 3.9% above the same period of 1939. Sales for house heating purposes gained 25.0%, commercial uses gained 7.2%, and industrial uses increased 18.2%.

Natural gas sales for domestic purposes showed an increase of 14.7%, while industrial sales gained 13.2%.

■ ■

Oklahoma Co. to Install Dehydration System

The Consolidated Gas Utilities Corp., Oklahoma City, Okla., will install a Diethylene Glycol dehydration system at its Twitty compressor station, near Shamrock, Texas, according to E. C. Joullian, executive vice president. The plant will be constructed by the company under supervision of C. S. Worley, engineer and purchasing agent.

Mr. Worley states that the system is designed to dehydrate 40 million cu. ft. of natural gas daily at a maximum discharge of 400 lbs. working pressure. A small pump house, 10x12 ft., will be constructed to protect the pumps and motors. The system will cost from $15,000 to $20,000, and is expected to be installed and ready for service during August, this year.

■ ■

Appalachian Meter School Will Be Held In August

The third meeting of the Appalachian Gas Measurement Short Course will be held August 19, 20, 21, 1940. it has been announced by Chairman Ray W. Hitchman, superintendent of gas measurement for the United Fuel Gas Company of Charleston, W. Va. Mr. Hitchman is developing the program in which nationally known authorities in the gas industry will participate.

The Proceedings of the second annual short course, which was jointly sponsored by the University of West Virginia at Morgantown, have been printed in book form and are now being distributed to all who were registered at the 1939 meeting.

■ ■

P. G. & E. To Build New Main From Oakland To Alameda

The Pacific Gas & Electric Co., San Francisco, Calif., has announced its plans to construct the third main from Oakland to Alameda, at a cost of $85,000, in order to furnish natural gas to the naval air station being built on the Alameda shore of the bay.

The submarine section of the pipe line will be laid in a trench across the floor of the Estuary to a depth of 45 ft. below the surface at low water, and wrapped in a special covering as protection against corrosion.

Work will begin as soon as the War Department issues the necessary permit and these proceedings will require about three months to complete.

■ ■

Montana-Dakota Co. Begins New 110-Mile Montana Line

The Montana-Dakota Utilities Co., Minneapolis, Minn., has recently awarded contracts for equipment and material to be used in the construction of a 110-mile pipe line from Fort Peck, Mont., to a point near Glendive, Mont., it has been announced by Cecil W. Smith, of the Montana-Dakota company. The new line will make natural gas service possible for the towns of Nashua, Frazer, Wolf Point, Poplar, and Richey, Mont., and will connect the company's existing natural gas pipe lines from the Bowdoin gas field in northern Montana with its pipe line system at the Baker gas field in southeastern Montana.

The main transmission line will be constructed of 8-in. ID pipe, while about five miles of 3-in. and 4-in. ID pipe will be used for the town distribution systems. Approximately 4700 Dresser couplings will be used, and the electric weld pipe with 7/32-in. wall thickness will be manufactured by Youngstown Sheet & Tube Co.

The Federal Power Commission approved construction of the line after finding that it would transport gas to a market not already served with natural gas. Construction of the line was scheduled to begin July 1.

■ ■

Boston Consolidated Gas Co. To Build Purifying Plants

The Boston (Mass.) Consolidated Gas Co. has recently awarded a contract to the Koppers Co., Pittsburgh, Pa., for the construction of equipment for the purification of manufactured gas which is supplied to domestic, commercial and industrial customers in the Boston area.

The new plants, to replace old equipment, will be built at Everett, Mass., and will consist of a Thylox plant for the removal of sulphur and a plant for the removal of gum. The Thylox plant will remove sulphur from an average flow of 36,000,000 cu. ft. of gas a day, but can handle 45,000,000 cu. ft. per day. The gum removal plant will take gum from approximately 66,000,000 cu. ft. of gas a day. Both plants will be completed by September 15.

■ ■

State Fuel Supply Co., Okla. Adds to Office at Cement

The State Fuel Supply Co., of Oklahoma City, Okla., during June, extended its office building at Cement, Okla., to make room for installation of a new gas meter repair and testing shop.

About 300 sq. ft. have been added to accommodate all new meter repair and testing machinery and equipment to take care of gas properties of the company in Cement, Cyril and vicinity.

■ ■

The gas industry is one of the nation's oldest public utilities—and also ranks among the oldest industries which have brought about our modern civilization and developed our high living standards.

New Printing Process Makes Use of Natural Gas

NATURAL gas was selected to heat ink, metal and rollers in a new printing process adopted by a new publication, *PM*, which appeared in New York for the first time June 18. The Brooklyn Union Gas Co., Brooklyn, N. Y., furnishes the gas. The new paper is to be published daily and Sunday, the weekday issues consisting of 32 pages and the Sunday editions of 64 pages.

Used in the new process is a new type of ink which is solid at 200° F., but when heated to about 250° F. it flows readily. When used, it must be kept at the high temperature until it hits the paper, where the sudden coolness will cause it to solidify instantly, leaving all ink on the surface of the paper.

In the furnace supplying the heat for the melting of metal, 775 cu. ft. of gas an hour is consumed, and the annual consumption has been estimated at 1,000,000 cu. ft. In the press room, gas will heat hot water, which in turn will heat a new type of ink being used for the paper and also the rolls on which the stereotype plates are placed. It has been estimated the hot water heating units will use about 10,000,000 cu. ft. annually.

■ ■

O. L. Moore, Retired Calif. Executive, Passes

O. L. MOORE

Oscar L. Moore, retired Southern California Gas Company executive, died in Los Angeles on June 4, at the age of 58. Mr. Moore was a former member of the Los Angeles Gas and Electric Corp., serving for many years as manager of the customers department in that organization. At the time of his retirement in 1939 he had a record of 35 years continuous service in the utility business in Los Angeles.

He was buried at Forest Lawn Memorial Park in Glendale.

■ ■

Jere K. Ross, New Jersey Executive, Dies

Jere K. Ross, manager of the contract department of the Wailes Dove-Hermiston Corp., Westfield, N. J., died May 15 at Scotch Plains, N. J.

Mr. Ross was graduated as a chemist from Lafayette College, in 1922, securing his Masters Degree in 1923. He joined the Wailes Dove-Hermiston Corp. as a chemist in the production laboratory in 1928. He later became field chemist; then superintendent of field operations and shortly before his fatal illness was advanced to manager of the contract department.

■ ■

Tuttle, Okla., May Have Gas

Tuttle, Okla., is negotiating with S. O. White of Sayre, Okla., for natural gas distribution service. Mr. White has proposed an agreement with the Oklahoma Natural Gas Co., to secure a supply of gas from that company's lines, nine miles east of Tuttle. He asks for a guarantee from Tuttle of 150 meters and assistance in securing right-of-way for his connecting pipe line.

OIL & GAS Equipment Review

Reg. U. S. Pat. Off.

• **THE READER'S ATTENTION is called to the coupon in the lower right hand corner of Page 55. This coupon is printed for the reader's convenience and will enable him to obtain with minimum effort further information on any of the items or catalogs listed in this department. All he has to do is to "ring" on the coupon the number that corresponds to the number printed over the item in which he is interested, clip out the coupon, and mail it to GAS, 1709 West Eighth Street, Los Angeles, Calif. — Editor.**

■ ■

For more information **"ring 3861"** on coupon

Joint Seal

Trade Name: Glycoseal.

Description: A joint seal which is resistant to propane, pentane, butane, benzol, gasoline, naphtha, grease and oils of all types.

Features Claimed: The material used is known as Glycoseal, and is flexible, leakproof and non-cracking. It will not harden and joints may be broken easily without damaging the fittings. It can be used on rubber as well as all kinds of metal fittings. Glycoseal will not harden under usual conditions of application. Samples left exposed to the air remain fluid and do not soak through textiles or other porous materials with which they come in contact. —*The Glyco Products Co., Inc., 148 Lafayette St., New York, N. Y.*

■ ■

For more information **"ring 3862"** on coupon

Motor

Trade Name: Type CS Squirrel-Cage Motors.

Application: For oil well pumping.

Description: These motors have a starting torque of approximately 275% of full load torque, and the slip is 6% to 9%. They are designed especially for oil well pumping, with rotary counterbalance where high starting torque or high peak loads are encountered. Their high slip characteristics allow the counterweight to help carry peak loads resulting in lower power consumption. These motors are weather-proof, splash-proof, and drip-proof, and can be used outdoors without additional protection. — *Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.*

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For more information **"ring 3863"** on coupon

Fillet Weld Gage

Trade Name: G. E. Fillet-Weld Gauge.

Application: Provides fast, accurate means of checking the size of fillet welds on jobs which have to meet rigid specifications.

Features Claimed: The new device, which slides readily into a shirt or trouser pocket, is of extremely simple construction, consisting of three stainless-steel stampings held together by a bolt and a knurled thumb-nut. Either convex, concave or standard fillets can be checked merely by fitting the edge of the gage flush against the work so that the indicating portion of the gage rests on the weld bead. The gage can be used on fillets of the following sizes: 5/16 in.; 3/8 in.; 1/4 in.; 7/16 in.; 1/2 in.; and 5/8 in. These sizes are clearly marked in black on the gage. — *General Electric Co., Schenectady, N. Y.*

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For more information **"ring 3864"** on coupon

Gasket Marker

Trade Name: John Crane Handy Gasket Marker.

Application: A tool for marking and outlining gasket sizes on sheet packing, eliminating the use of a compass or pair of dividers, and the necessity of referring to gasket tables or the taking of more than one measurement.

Features Claimed: The tool is made of rustproof spring brass, and all the necessary information for marking gasket sizes is etched in raised characters on the device. It is easy to use, and offers a quick and convenient method for marking gaskets for heavy, medium, standard and low pressure flanges, both ring and full-face types up to and including the 10-in. I.D. size.

Operation: The center of the gasket is located by thrusting a thumb tack or pin through the center hole at bottom of the marker. This pins the device to the sheet packing. Then a pencil point is placed through the hole (on center line of marker, representing I.D. of pipe) and a circle is scribed. The O.D. line of the gasket is found by placing the pencil point in the hole — left-hand column, representing ring O.D. for an extra heavy flange, ring style, and scribing a circle. The gasket is now marked and ready for cutting with knife or shears. — *Crane Packing Co., 1800 Cuyler Ave., Chicago, Ill.*

■ ■

For more information **"ring 3865"** on coupon

Cleaner

Trade Name: Hypressure Jenny Steam Cleaners.

Application: A portable steam boiler and jet for removing dirt and grease from floors, machinery, engines and truck bodies.

Description: A small, fast action boiler mounted on wheels and narrow enough to pass through doorways, equipped with flexible hose and insulated steam jet with nozzle control valve.

Features Claimed: Steam generated in 1½ minutes. Water surrounds fuel tank and stack, conserving heat. Operating cost, including fuel oil, soap, electricity and water, averages 20 cents per hour. Equipped with non-clogging heat coils, pressure atomizing fuel oil burner, electric ignition. — *Homestead Valve Manufacturing Co., Coraopolis, Pa.*

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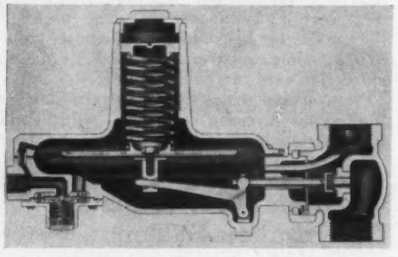
For more information **"ring 3866"** on coupon

Low Pressure Regulator

Trade Name: Fisher Low Pressure Service Regulator.

Application: A regulator with a safety relief valve which will reduce over-all dimensions and simplify piping, particularly for indoor installations.

Features Claimed: The relief valve of the regulator is diaphragm actuated, spring controlled and normally factory set and sealed to relieve at one pound. The upper diaphragm chamber is arranged to vent through the relief valve outlet. All working parts are accessible without breaking pipe joints. Valve bodies are interchangeable. Interior



construction provides automatic loading, assisting the regulator in maintaining a constant reduced pressure even though flow demand may be high. The diaphragms are highly sensitive and very tough. They are made of a special non-porous composition impervious to gases. The regulator is available in sizes ¾-in., 1-in., and 1¼-in. and suitable for initial pressure up to 150 lbs. It is recommended for reduced pressure ranges of 2 in. to 10 in. of water column and 7 in. to 16 in. of water column. — *Fisher Governor Co., Marshalltown, Iowa.*

■ ■

For more information **"ring 3867"** on coupon

Safety Insole

Trade Name: M. S. A. Safety Insole.

Application: New protection for the feet against nails, spikes, sharp metal projections and other dangerous underfoot hazards.

Features Claimed: Built of two layers of overlapping steel strips moulded in rubberized fabric, the Safety Insole is said to be remarkably light and flexible, bending freely with every movement of the foot, and yet fully capable of preventing injury from pentration of the boot-sole by sharp objects.—*Mine Safety Appliances Company, Thomas, Braddock & Meade Sts., Pittsburgh, Pa.*

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For more information **"ring 3868"** on coupon

Engine Coolers

Trade Name: Young Full-Flow Engine Jacket Water Cooler.

Application: For use in natural gas and gasoline compressor stations.

Description: An installation made for Continental Oil Co., Corpus Christi, Texas, consists of a bank of four full-flow engine

jacket water coolers for cooling the engine and gas cooler water of two Cooper-Bessemer 400-hp. gas powered compressors. Heat load and distribution are: (1) Two coolers, direct driven by 15-hp. gear reduction motor each to cool 1,320,000 B.t.u. per hour per engine, the engine jackets alone, each unit holding maximum engine jacket water temperature of 160° F. with 100° ambient air temperature; (2) one cooler to handle the heat load from the cooling water for the first stage of compressed gas, dissipating 458,000 B.t.u. per hour and maintaining a maximum intercooler water temperature of 135° F. with 100° ambient temperature; (3) one cooler direct driven by a 7½-hp. gear reduction motor to handle aftercooler water dissipating 618,000 B.t.u. per hour and holding a maximum aftercooler water temperature of 135° F. with 100° ambient air temperature.—*Young Radiator Co., Racine, Wis.*

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For more information **"ring 3869"** on coupon

Prest-O-Weld Equipment

Trade Name: W-108-Welding Blowpipe.

Application: A piece of equipment permitting quick changing from welding to cutting, and cutting to welding.

Features Claimed: One of the principal features of the W-108 welding blowpipe are the individual mixers in every head making correct flame adjustment easy, and giving definite resistance to flashback. Both the oxygen and acetylene for this "balanced-pressure" blowpipe may be set at approximately the same pressure in lb. per sq. in. as the number of the head. The welding heads provide a long, slender flame with a well-formed inner cone that permits thorough heating of even the bottom of the vee, and provides good control of the welding puddle.—*The Linde Air Products Co., 30 E. 42nd. St., New York City, N. Y.*

■ ■

For more information **"ring 3870"** on coupon

Ring-Balance Meter

Trade Name: Republic Mechanical Ring-Balance Meter.

Application: A new mechanical meter of the ring-balance type for metering steam, water, gas, air, etc., at static pressures up to 1000 lb. per sq. in.

Features Claimed: This new meter will give full scale readings on differentials as low as 3 in. of water, which is ideal for low pressure gas and air measurement. The meter is housed in a rugged steel case suitable for exposed locations. It is easily adjusted by changing a calibrating weight — has a 12 in. evenly graduated chart — is furnished with any combination of indicator, recorder and cyclometer type integrator.—*Republic Flow Meters Co., 2240 Diversey Parkway, Chicago, Ill.*

■ ■

For more information **"ring 3871"** on coupon

Burner

Trade Name: John Zink Multi-Way Burner.

Application: Combination oil and gas burner serving the combustion needs of refinery units.

Features Claimed: The burner frame is designed to carry the working parts of any of the types of refinery burners manufactured by the John Zink Co. This frame has a steel flange for bolting to a furnace front. Into this frame will fit the working parts of any one of the following types of burners: Series Y, Z, BMY, BMZ, BMD (dual aspirator type), and HBM (single aspirator type). The burner is manufactured in seven different sizes, with a .15-in. draft loss through the burner. By unbolting a center flange that carries the working parts, the plant operator will be able to switch to any other burner.—*John Zink Co., 4401 So. Peoria St., Tulsa, Okla.*

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For more information **"ring 3872"** on coupon

Test Gauge

Trade Name: Ashcroft Test Gauge.

Application: For checking accuracy of pressure gauges.

Features Claimed: Accuracy is guaranteed to within ¼ of 1% of the scale range. The outer edge of the dial is a mirror on which the tip of the pointer reflects if the user is not in the correct position to read the gauge accurately. In addition, the gauge has a transparent cover which opens up the dial for easy reading. It is molded of a clear, transparent plastic with a compression strength of 15,000 lbs. per sq. in. The case is Phenol, light in weight and ideal for portable laboratory test work.—*Ashcroft American Gauge Division, Manning, Maxwell & Moore, Inc., Bridgeport, Conn.*

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For more information **"ring 3873"** on coupon

Oxygen Gage

Trade Name: Ashcroft American Oxygen Duragauge.

Application: A gage for high pressure oxygen service.

Features Claimed: The case is a heavy brass casting with a safety solid front and a full open back. The back of the gage is sealed with moisture-proof paper protected by a thin brass disc. The mounting lugs on the case hold it away from the wall. The Bourdon tube is Byrellium Copper, and the socket is forged bronze. No steel is used for the sake of safety. The gage is also stream-lined, having the new, clear gage cover of transparent plastic. This opens up the dial for easier reading.—*Manning, Maxwell & Moore, Inc., Bridgeport, Conn.*

Before You Buy, Consult the *Latest Trade Literature* Concerning Equipment

This department of GAS will gladly mail you without obligation any of the selected bulletins listed below. Use the coupon on page 55 of this issue, indicating by number above those you desire.

For more information **"ring 3874"** on coupon

"Safety Shoe Buyers' Guide" is included in Lehigh Safety Shoe Co.'s Catalog No. 9, and explains Safety Shoe features and constructions in simple, non-technical terms.

For more information **"ring 3875"** on coupon

Broadside N-33 features in a compact folder a brief description of industrial temperature-measuring instruments manufactured by the Leeds & Northrup Co.

For more information **"ring 3876"** on coupon

A 32-page, 1940 directory published by the Allis-Chalmers Mfg. Co. is a complete directory on engineering literature, power, electrical and industrial machines produced by the company.

For more information **"ring 3877"** on coupon

Bulletin S-550-B7, published by Worthington Pump & Machinery Co., deals with the gas engine, and describes the specifications of their 25-in.-stroke engine.

For more information **"ring 3878"** on coupon

A new 48-page condensed price list, Bulletin V-109, covering all types and sizes of Nordstrom valves, has just been issued by the Merco Nordstrom Valve Co.

For more informttion **"ring 3879"** on coupon

Several publications issued by the Cochrane Co. give information problems concerning their equipment. The publications are Nos. 2096, 2089, 2800, 2870, 2925, 2090.

For more information **"ring 3880"** on coupon

The Minneapolis-Honeywell Regulator Co. recently published a 44-page catalog, listing prices for their products effective as of March 1, 1940.

For more information **"ring 3881"** on coupon

A new catalog section on its line of Plastikon rubber putty, adaptable to many uses in building and industry, has just been published by The B. F. Goodrich Co.

This coupon will bring you further information, catalogs, etc., concerning products described in the Oil & Gas Equipment Review Department of GAS. "Ring" the numbers of items which interest you, sign and mail this coupon to **GAS, 1709 West Eighth Street, Los Angeles, Calif.**

3861	3862	3863	3864	3865	3866	3857	3868	3869	3870
3871	3872	3873	3874	3875	3876	3877	3878	3879	3880
3881									

July, 1940

Name.....**Position**.....

Company.....

Address.....

City.....**State**.....

CURRENT Reading

Metallic Corrosion Passivity and Protection, by Ulick R. Evans. Published by Edward Arnold & Co., London, England, 1938. Contents: Simple Examples of Corrosion and Passivity; Thin Films; Oxidation at High Temperatures; Atmospheric Corrosion and Tarnishing at Ordinary Temperatures; Corrosion by Stagnant Liquids; Corrosion by Moving Liquids; Hydrogen Fixation; Influence of Constituents of the Liquid; Influence of the Major Constituents of the Metallic Phase; Influence of the Minor Constituents of the Metallic Phase; Influence of Stress and Strain; Influence of Contacts and Crevices; Protection by Metallic Coatings; Protection by Paints and Enamels; Testing.

Hydrogen Sulfide Detector—F. B. Behrens. *Oil and Gas Jour.*, Mar. 28, 1940, p. 86. With the erection of the nonselective polymer unit at the refinery of the Wilshire Oil Co., Norwalk, Calif., it was necessary to scrub the vapors free of hydrogen sulfide before processing in the polymer plant. In the interest of economy it was mandatory that the scrubbing method be a regenerative process which entailed the handling of hydrogen sulfide in a comparatively pure state — an extremely hazardous procedure. Usual safety precautions were the use of various detecting devices or enclosure of the plant proper in a "sealed can."

Conditioning of Gases and Air—*Chem. and Met.*, May, 1940, pp. 285-332. This special section contains the following articles: Use of Psychrometric Principles; Types of Psychrometric Charts; New Psychrometric Chart; Condensation by Refrigeration; Absorbent Solutions; Lithium Chloride; Calcium Chloride; Activated Carbon Adsorption; Silica Gel Adsorption; Activated Alumina Adsorption; Other Dehydration Methods; Choice of Dehumidification Methods; Humidification Processes; Compression Equipment Heat Transfer Surfaces; Gas Cleaning Equipment; Liquid-Gas Contractors; Air Conditioning; Recovery of Solvent Vapors; Drying Psychrometry.

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BUTANE-PROPANE
GASES

415 Pages

CONTENTS: Semi-Bulk Distribution: Use of Butane in Buses: Combination Propane Operated Utility Plant: Use in Internal Combustion Engines: Design and Installation of Storage: Supply from Petroleum Refineries: Engineering Data on the Lower Olefins: Domestic Appliance Testing and Utilization: Economical Comparisons with Coal, Oil, Electricty. Producer Gas, Manufactured Gas: Town Plants: Manufacture from Natural Gas: Specal Uses: Volume Correction Factors: Transportation: Use with Other Gases: Analysis and Testing: Properties of Mixtures: Bottled Gas Distribution: Bibliography: Central Plant Directory: Catalog Section.

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Los Angeles, Calif.

Viscosity of Gases and Vapors at High Pressures — E. W. Comings and R. S. Egly. *Industrial and Engineering Chemistry*, May, 1940, pp. 714-718. A graphical method based on the concept of corresponding states is described for predicting the viscosity of pure gases and vapors at high pressures when the viscosity at atmospheric pressure and the critical temperature and pressure are known. The method is compared with published viscosity data on seven gases and vapors. At pressures and temperatures above the critical the predicted viscosities differ from those measured experimentally by less than 20%.

Utilization of Natural Gas for Chemical Products — Bureau of Mines Information Circular 7108. In this paper the story of the manufacture of chemical products from natural gas is told in graphic form. The industry is developing so rapidly that some products may have been omitted, but every effort has been made to include all that are important or likely to become so. Ten charts, together with explanations thereof, are included in the circular.

Commodities in Industry — Commodity Research Bureau, Inc. This 720-page reference book was prepared with the cooperation of more than 100 leading American corporations, the various trade bodies and government agencies. It contains a feature study of "War and Commodities," which analyzes commodity developments in the present war as well as the World War. Other feature articles include an analysis of the leading synthetics of today, consumer habits and consumption, and the influence of weather on supply and demand of basic commodities. In addition to the feature section are individual sections for each of the 75 basic commodities covered. In all, there are 200 charts and 625 statistical tables.

Texas Petroleum Register, 1940 — R. W. Byram & Co., 104 E. 13th St., Austin, Texas; price, $10. A comprehensive review of the Texas petroleum industry, giving fields, companies, and executive personnel, with separate directories for 526 oil fields. Lists oil operators, oil and gas producers, natural gasoline plants, pipe line companies, crude oil and gas purchasers, gas and oil dealers, refining companies, carbon black plants, royalty companies, engineers, royalty and lease dealers, and service and supply companies. Information on companies includes corporate organization, executive personnel, and extent of capitalization and operations.

Management and the Worker — F. J. Roethlisberger and William J. Dickson, assisted by Harold A. Wright. Published by Harvard University Press, Cambridge, Mass., price $4.50. This is a report of a scientific study made of employe attitudes, relationships and the effect of working conditions on output. The scope of the study was extended when it was found that employe efficiency improved with each change in working conditions. Results indicate the importance of factors affecting personnel.

The Story of the Lamp (and the Candle) — F. W. Robins. Published by Oxford University Press, 114 Fifth Ave., New York; price, $5. This 155-page book is a history of lighting appliances and artificial lighting throughout the world. Gas lighting, the author states, was the first invention in the direction of modern illumination.

The Compressibility of Gases — G. G. Brown. *Petroleum Engineer*, Mar., 1940, pp. 27-30. Part 3. Measurement of gas flow under pressure.

Small Homes Data Book—National Home Builders Bureau, Inc., 572 Madison Ave., New York City. This reference manual has been created for building material dealers, architects and contractors, home finance institutions and home service departments of utility companies. It consists of over 400 pages beginning with inserts by FHA, Producers' Council, National Lumber Manufacturers Association, and other service organizations in the small homes field. This presentation is followed by catalogs of many of the manufacturers of the building industry, giving factual information on products logical for use in the building of small homes.

Chemical Removal of Scale from Compressor Engines—Guy F. Williams. *Oil and Gas Journal*, May 2, 1940, pp. 34, 35. The accumulation of scale in the cooling jackets of compressor engines used in pipe line compressor stations causes frequent, costly shutdowns with attendant loss of efficiency in plant operation. Recently three successful scale-removal projects were completed for the Natural Gas Pipe Line Company of America at their Glasco, Kan., Genesee, Ill., and Truro, Iowa, compressor stations. The method of removal is described.

Efficiency of "Gas Recycling" Speeds Plant Construction Plans—E. E. DeBack. *National Petroleum News*, May 15, 1940, pp. R-171, etc. Production of distillate from true gas phase structures by "recycling" is becoming of increasing importance. It has been found that input wells should have the maximum possible sand thickness, permeability and exposed sand face to reduce the pressure necessary to return the dry gas to the formation. Location of wells requires extreme care.

Partial Oxidation of Petroleum and Natural Gas—W. L. Faith. *Refiner*, Mar., 1940, pp. 50-54. The present status of the partial oxidation of petroleum hydrocarbons is reviewed. The effect of the variables time, temperature, pressure, concentration, and catalysis on the reaction is emphasized. Problems involved in equipment design are also presented.

Conversion of Petroleum—Dr. A. N. Sachanen, Research and Development Division, Socony-Vacuum Oil Co., Inc., published by Reinhold Publishing Co., 330 West Forty-second Street, New York City, 1940. Relates to the fundamental principles and practices of converting petroleum products into gasoline and other fuels, going into considerable theoretical and technical detail without attempting to discuss historical development and patent literature at length. Chapter headings are: Thermal and Catalytic Reactions of Hydrocarbons, Fundamental Factors of Cracking, Fundamental Factors of Hydrogenation, Cracking Equipment, Cracked Gasoline, and Treatment of Cracked Gasolines and Crack Products Other Than Gasoline. 405 pages.

The Wagner Act—Dr. John H. Mariano, 229 pages, published by Hastings House, 135 Front Street, New York, price $2.50. Analysis, discussion and appraisal of controversial socialistic legislation presented in the form of four separate essays by an active labor relations counsellor. The thesis is social justice in labor relations and effort is made to create understanding of collective bargaining. Accounts of cases are presented to illustrate the functioning of the Wagner Act, use of labor injunctions the clash between labor and judiciary, and the development of labor as a political party.

Northern Natural Continues Extension Of Gas Transmission Facilities

THE Northern Natural Gas Co., Omaha, Neb., has recently started work on an expansion program involving the laying of approximately 62 miles of loop lines, 32 miles of new transmission lines, five branch lines, and the installation of additional compressor units totaling 5600 hp., it has been reported by J. P. Bristow, assistant chief engineer.

Four loop lines are under way: (1) a 13.2-mile, 24-in. line north from the Mullinville, Kan., compressor station; (2) a 26.7-mile, 24-in. line north from the Bushton, Kan., compressor station; (3) an 11.7-mile, 24-in. line near Washington, Kan., north from the Clifton compressor station, and (4) a 10.4-mile, 24-in. line north from the Beatrice, Neb., compressor station.

In addition to the loop lines, the company is constructing 9.5 miles of 12-in. line from the Palmyra, Neb., compressor station to the 12-in. Lincoln branch line, and 22.5 miles of 10-in. line and measuring stations for serving the towns of Boone and Ames, Iowa.

Three of the five branch lines being built in Iowa extend from the 16-in. loop line in Iowa and Minnesota: (1) a 3-in. line to Sergeant Bluff; (2) a 2-in. line to Sutherland, and (3) a 2-in. line to Everly, Iowa. Town border stations are to be built in each of these three towns, and a distribution system will be constructed to serve the consumers at Everly.

At another part of the company's system, a 2-in. branch line and town border station will be constructed at Kensett, Iowa, and a 2-in. branch line and measuring station equipment will be built to serve the town of Griswold, Iowa.

Compressor station construction includes a 3000-hp. station on the 20-in. Hugoton-Mullinville, Kan., line at a point near Sublette, Kan., and the installation of an additional 1300-hp. unit at both the Bushton, Kan., and Beatrice, Neb., compressor stations.

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INDUSTRY *Personalities*

Halfdan Lee, president of Eastern Gas & Fuel Associates, Boston, Mass., was recently decorated by the government of Norway with the Medal of St. Olaf. Mr. Lee, a Norwegian, received the medal for services to his native land and Crown Prince Olav and Princess Martha when they visited Boston last year.

E. T. Howard has recently been appointed general sales manager of the General Controls Co., Glendale, Calif. He has been with the company for the last six years and has just completed a three months' trip visiting each General Controls branch office and opening a new branch office in Boston, Mass.

H. L. Farrar, president of Coast Counties Gas and Electric Co., Santa Cruz. Calif., has announced the appointment of **Louis Wollenberger** of Santa Cruz, Calif., as district manager of the Imperial Valley division with headquarters in El Centro. Mr. Wollenberger succeeds **E. B. Mason, Jr.,** who will assume the position of traveling auditor with headquarters at Santa Cruz.

L. WOLLENBERGER

Mr. Wollenberger is a graduate of the University of Michigan. He began his career in the gas industry in 1927, with the Southern California Gas Co. In July, 1930, he joined Coast Counties Gas & Electric Co. as measurement engineer. He has been in charge of industrial gas utilization and sales since 1933.

Edward C. Uhlig, chief chemist of the Brooklyn Union Gas Co., Brooklyn, N. Y., retired from active service at the end of June. He joined the Brooklyn Union Gas Co. in 1904, and was chairman of A.G.A. chemical committee for three years. Two hundred friends in the company honored Mr. Uhlig at a dinner party.

Glen Bowman, salesman for Robertshaw Thermostat Co., Youngwood, Pa., attended the annual convention of the Canadian Gas Association and Pacific Coast Gas Association held at Jasper National Park Lodge, Alberta, Canada, July 3-5. On his trip he visited the Grayson Heat Control plant in Lynwood Calif.

W. R. Murrow, after 35 years with the Kansas Gas and Electric Co., Independence, Kan., has retired as active district manager but will continue with the company in the capacity of a consultant. His successor is **J. D. Turner.** In 1906, Mr. Murrow organized a company in Independence, Kan., which was sold to the Kansas Gas and Electric Co. in 1911. He was retained by the new company and appointed to the position of district manager, which he has held continuously since.

Hubert C. Blackwell, president of the Cincinnati Gas & Electric Co., received a degree of doctor of engineering from Purdue University. The citation for his new diploma reads, "Engineer and executive whose talented energy has been devoted to the construction, operation and administration of public utilities and to the solution of problems of human relations in industry." He graduated from the university in 1902.

Ray Broughton, manager of the National Utilities Co., Kirksville, Mo., will leave to manage gas companies in seven towns located in Maryland and Delaware. His head office will be at Salisbury, Md. **F. E. Pratt,** Atlanta, Ga., will succeed Mr. Broughton.

Boyd F. Koepke has recently been appointed sales engineer of Clark Brothers Co. Inc., Olean, N. Y. His headquarters are at the company's branch office at Tulsa and he will serve the Midcontinent area.

Mr. Koepke received a B. S. degree at the University of Oklahoma in 1921. His last position before joining the Clark organization was with the refinery division of the Frick-Reid Supply Corp., Houston, as refinery sales engineer.

F. D. Bradley, Southern Union Gas Co., Dallas, was elected second vice president of the Purchasing Agents Association of Dallas, Texas, April 14.

Roy Runion, formerly of Wooster, Ohio, has been appointed sales manager for a new store of the East Ohio Gas Co. at Orrville, Ohio. He has had over 12 years' experience in the home appliance field, part of the time operating a store of his own.

A. G. A. President Walter C. Beckjord (left) congratulates retiring president of the Mid-West Gas Association, Fred J. Gunther, the Iowa-Nebraska Light and Power Co., Lincoln, at the Association's annual convention held in Lincoln, Neb., April 15-17.

A. C. JOY

A. C. Joy, advertising manager of the Pacific Gas & Electric Co., San Francisco, Calif., was elected president of the San Francisco Advertising Club, May 15. For the past year he was vice president and chairman of the program committee, after several years of service on the board of directors. The San Francisco club is one of the active and most progressive advertising clubs in the country.

Henry S. Minster has been elected president of the Roberts & Mander Stove Co., Hatboro, Pa. Mr. Minster succeeds **Clarence V. Roberts**, who has been president since the company was founded in 1905. Mr. Roberts becomes chairman of the board.

Mr. Minster was graduated in 1923 from the Wharton School of Finance and Commerce of the University of Pennsylvania.

Dearborn Chemical Co., Chicago, announces the appointment of **Dan Hiskey** to their research staff specializing in pipe line coatings and wrappers.

Mr. Hiskey is a graduate of the University of Southern California and for the past 10 years has been with the Southern California Gas Co. In his new position, Mr. Hiskey will cooperate with the Dearborn staff in laboratory research on special problems and will also devote a good deal of time to the improvement of pipe coating and wrapping application methods.

Dearborn Chemical Co. are the manufacturers of NO-OX-ID Rust Preventives and NO-OX-IDized Wrappers for pipe line protection.

LeRoy Reeves, local agent for the Union Gas System, Inc., Independence, Kan., for 10 years, resigned last April. Mr. Reeves was a member of the company for 21 years. **Floyd Lovett** succeeds Mr. Reeves as local agent for the company.

R. B. Smythe, formerly manager of the Sturgis office of the Montana-Dakota Utilities Co., Minneapolis, Minn., has taken over the management of the Belle Fourche office of the company. **A. P. Honigh**, former manager, has been transferred back to Lead.

Ford H. Mugg is now local manager of the Consolidated Gas Utilities at Lawton, Okla. Mr. Mugg was recently transferred from Oklahoma City.

Larry Mullins has been named as general manager of the Vermillion (S. D.) Natural Gas Co. Mr. Mullins has been with the company as auditor since its organization in 1935. He succeeds **B. W. Christie,** who died recently.

Ira A. Aiken, foreman in the construction engineering department of Southern California Gas Co., Los Angeles, retired May 1 under the company's uniform pension and benefit plan. Mr. Aiken joined the company in 1921.

Col. W. F. Rockwell, president of Pittsburgh Equitable Meter Co., has recently been elected a director of the Commercial National Bank and Trust Company of New York.

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Here, shown in the photograph, is the Greenlee No. 790 Hydraulic Pipe Pusher as set up by one contractor to install a 4-inch pipe under a paved street. With only a short trench on each side of the street it was possible to install the pipe without damaging the pavement or interfering with the traffic. He did it the easy way by doing it the Greenlee way!

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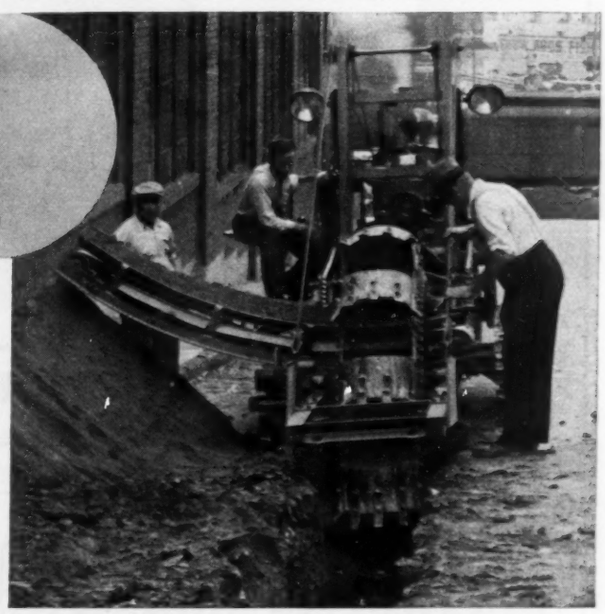

WATCH YOUR COSTS GO DOWN

BECAUSE in "Clevelands" you have equipment that exactly fits your work. Whether the trench to be dug is long main line through tough soil and difficult terrain or distribution trench in the close confined areas of city and suburb.

Here is equipment that meets exactly every requirement. Because it is compact and streamlined for light weight and because it is rugged and dependable and supreme in construction it is the kind of equipment you need to get the pipe in the ground quickly and at lowest cost.

Hair-trigger, truck and trailer, mobility make real savings available on more jobs—anywhere in your system. Why not put "Clevelands" to work immediately and watch your trenching costs go down to rock bottom. Write for detailed information today.

THE CLEVELAND TRENCHER COMPANY

"Pioneer of the Small Trencher"

20100 St. Clair Ave., Cleveland, Ohio

"CLEVELANDS" *Save More* — Because they *Do More*

C. O. G. MILLER

R. W. MILLER

Election of **C. O. G. Miller,** for 42 years president of Pacific Lighting Corp., San Francisco, to the position of chairman of the board, and election of **Robert W. Miller,** to succeed him in the presidency, was announced June 6, after a meeting of the directors.

The position of chairman of the board has been newly created, and the position of executive vice president, formerly held by Robert W. Miller, has been abolished.

C. O. G. Miller is one of the founders of Pacific Lighting Corp. and its predecessor company organized in 1886. He occupied the position of treasurer and director in the company until 1898, when he was elected president. Robert W. Miller has been an officer of the company since 1924, and has been executive vice president since 1929. Under the direction of these men the companies in the Pacific Lighting group composed of Southern California Gas Co., Southern Counties Gas Co., and Santa Maria Gas Co., have developed into one of the largest intrastate natural gas utility system in the United States and now serve 930,000 customers.

Directors also declared the regular quarterly dividend of $1.25 a share on the $5 dividend preferred stock, payable July 15 to stock of record June 30, 1940.

Kenneth J. Haines has been appointed advertising and publicity manager of the Northern Indiana Public Service Co., Hammond, Ind. He was formerly with the Illinois Northern Utilities.

Henry L. O'Brien was elected first vice president of the Cities Service Company of New York. He was also appointed a director and a member of the executive committee. He was graduated from Cornell University in June, 1921.

John M. McMillin, of the same company, was elected vice president and a member of the executive committee. He is a graduate of the Massachusetts Institute of Technology. **Theodore Stone** was made assistant treasurer in charge of the transfer department.

Elsie Mae Gates has recently joined the Gas Service Co., Kansas City, Mo., after receiving a B.S. degree in home economics at the Oklahoma College for Women, Chickasha, Okla.

George A. Dickie, mechanical superintendent of the B. C. Electric Railway Co., Vancouver, B. C., was honored on the completion of 50 years of service with the company. Mr. Dickie was presented with a silver tea and coffee service at a dinner party held in his honor at a leading hotel.

D. S. REYNOLDS

T. F. SMITH

David S. Reynolds, chief engineer of the Boston (Mass.) Consolidated Gas Co., has been made vice president in charge of engineering, manufacturing and construction, it was announced by **E. M. Farnsworth,** president of the company. **Thomas F. Smith** was appointed superintendent of the customers' service division, as assistant vice president in charge of distribution.

Mr. Reynolds came to the United States from England at the age of 17 and graduated from the Massachusetts Institute of Technology in 1903. In that year he started with the old Bay State Gas Co. as a draftsman. In January, 1929, he was made chief engineer and in March, 1935, also assumed the duties of assistant treasurer.

Mr. Smith started in clerical work with the company in October, 1919. He has been superintendent of this division since April, 1929. The new appointments were effective May 23.

F. S. Wade, president of the Southern California Gas Co., Los Angeles, last month announced a change in the office of treasurer and certain personnel under the supervision of **E. N. Simmons,** controller of the company.

The new appointments become effective July 1, 1940 and are: **L. D. Romig,** treasurer, has been named assistant controller in charge of tax and pension matters; **G. A. Detrick,** general auditor, assumes the duties of treasurer; **S. W. Binckley,** assistant rate and appraisal engineer, was named assistant to the controller; and **A. B. Cates, Jr.,** special accountant, was appointed general auditor. Mr. Simmons has been controller of the company since 1937.

FRANK HENKE

Frank Henke, of the Harper-Wyman Co., Chicago, was advanced recently from the position of assistant sales manager to sales manager. Following his graduation from Armour Institute of Technology, in 1935, Mr. Henke became associated with the firm in an engineering capacity. In 1937 he was made assistant sales manager, and has been active in the utility and range manufacturing fields.

Watson E. Derwent of Rockford, Ill., vice-president of the George D. Roper Corp., has been elected a director of the American Gas Association to fill the vacancy created by the death of E. R. Guyer of Chicago. Mr. Derwent is a director of the Association of Gas Appliance and Equipment Manufacturers, New York, and chairman of that organization's domestic gas range division.

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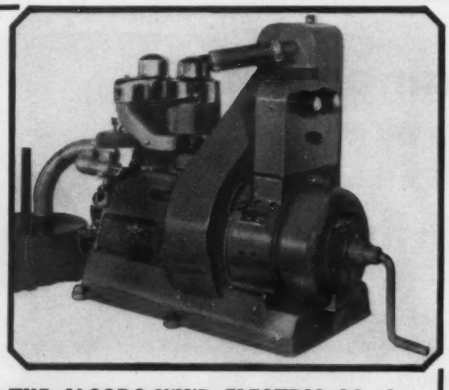
SPECIAL CATHODIC UNIT

Maximum Protection at Minimum Costs!

Designed exclusively for cathodic protection of pipeline. Manufactured completely in our factory. Operates on natural gas or gasoline. Few moving parts—no valves, gears, belts or pumps to break down. Positive lubrication and temperature control. Lowest operating and maintenance costs on record. *Unconditionally guaranteed for one year!*

Write at once for complete details!



THE JACOBS WIND ELECTRIC CO., Inc.

PIPE LINE DIVISION MINNEAPOLIS, MINN.

GAS—1709 W. 8th Street, Los Angeles, California

Yes! SEND ME GAS

for 3 Years at $2.00

SUBSCRIPTION RATES: United States, Canada, Mexico and Central American countries (in advance), three years $2.00; all other countries, $3.00 per year.

Name..... Position.....

Company.....

Address.....

City..... State.....

☐ Check enclosed ☐ Send bill

Charles E. Bennett, president of the Manufacturers Light & Heat Co., Pittsburgh (and his family), last month visited the Pacific Coast. As the guest of **A. F. Bridge**, vice president of Southern Counties Gas Co., Mr. Bennett inspected the recently completed Los Angeles Branch of the A.G.A. Testing Laboratories. Both Mr. Bennett and Mr. Bridge are members of the Laboratories' Managing Committee.

Herbert A. Watson has been appointed director of sales research for the domestic gas range division of the Association of Gas Appliance and Equipment Manufacturers, it has been announced by **Frank H. Adams**, president of the Association. Mr. Watson, who was formerly sales promotion manager for the Pennsylvania Power & Light Co., whose general offices are in Allentown, Pa., will cooperate with utility companies and retail dealer outlets throughout the United States and Canada in developing creative sales methods and formulating localized sales promotion activities in behalf of the CP gas range program.

J. M. McIntyre, president of Northern Utilities Co., Casper, Wyo. was recently presented a plaque in recognition of his 20 years of service with the company. Presentation was made at a banquet held at the close of a two-day sales meeting of executives, servicemen and salesmen of the Northern Utilities Co. and the North Central Gas

Merle Bahan, manager of the Guthrie Gas Utilities Co., Guthrie, Okla., has been elected a director of the Oklahoma State Chamber of Commerce. He is one of 50 directors chosen.

A. G. A. Domestic Research Committee Publishes Burner Design Bulletin

A PHASE of research conducted during the past few years at the American Gas Association Testing Laboratories in the field of domestic gas appliances has been an investigation of fundamentals of burner design. This work, sponsored by the Committee on Domestic Gas Research, of which F. J. Rutledge is chairman, has been carried on jointly in connection with basic research on domestic gas ranges and domestic water heaters. This burner design data has been assembled in Bulletin No. 10, "Research in Fundamentals of Atmospheric Gas Burner Design," which was distributed to A.G.A. gas company members in May.

This bulletin covers primarily burners of the type commonly employed on gas ranges and gas water heaters, but is in many respects applicable to atmospheric burners used on all types of domestic gas appliances. New data on burner design and a correlation of burner design with the burning and physical characteristics of the many types of fuel gases distributed in the United States and Canada, are set forth. Pertinent data from authoritative sources have been abstracted and included.

Covered by this bulletin are designs for satisfactory flame characteristics, for good primary air injection, and for quiet operation. Capacity and primary air injection characteristics of orifices are also discussed. The bulletin is illustrated with graphs and diagrams.

Copies of Bulletin No. 10 are available at the A.G.A. Testing Laboratories, 1032 East Sixty-second Street, Cleveland, Ohio.

NOTICE

In the June issue of GAS, an error was made in the JOHN ZINK COMPANY advertisement. First paragraph should read:

SERIES "V" BURNER
Pre-Mix—absolutely noiseless, especially good for boiler installations in churches, schools, and apartments.

JOHN ZINK BURNERS

PERFORMANCE!

NO OTHER BURNER CAN MATCH

Three Types of John Zink Burners

BI-AIR—an improved multi-jet refractory block type with vibrator eliminator.

PRE-MIX—absolutely noiseless, for churches, schools and apartments.

ZINK STAR—low pressure radiating armed spider type with 100% turn-down.

Manual Operation or Fully Automatic for

HEATING BOILERS—COMMERCIAL BOILERS

★

JOHN ZINK COMPANY

Burners - Floor Furnaces - Unit Heaters

TULSA, OKLAHOMA **NEW YORK CITY**

Hotel and Restaurant Men Convene In Atlanta

APPROXIMATELY 180 men from 23 states attended the 1940 Hotel, Restaurant and Commercial Gas Sales Conference, sponsored by the A.G.A. Industrial Gas Section in Atlanta, Ga., May 30 and 31. New small commercial gas appliances for counter use were displayed by more than 20 manufacturers.

Sessions were presided over by Franklin T. Rainey, chairman of the Industrial Gas Section; H. Carl Wolf, vice chairman of the Section; Charles W. Gale, Knoxville, Tenn., and Arthur M. Apmann, Derby, Conn.

Principal speakers were E. L. Stauffer, South Carolina Power Co., Charleston; John F. Mooney, Standard Gas Equipment Corp., Orlando, Fla.; Eugene J. Stern, Georgia Public Utilities Co., Atlanta; W. H. Duguid, Jacksonville (Fla.) Gas Co.; W. H. Ligon, Atlanta (Ga.) Gas Light Co., and George S. Jones, Jr., Servel, Inc., Evansville, Ind.

A dramatized symposium on the sales points of the new equipment on display was conducted by Harry A. Sutton, Public Service Electric & Gas Co., Newark, N. J.; Arthur M. Apmann; E. V. Fineran, Washington (D. C.) Gas Light Co., and Charles W. Gale. Another symposium on the selling points for volume water heating was a feature of the conference.

■ ■

Donaldsonville, La., Gives Franchise for Gas

Donaldsonville, La., has granted to Jessie Barbour of Franklin, La., a 25-year franchise for the sale and distribution of natural or manufactured gas to the city. Under the terms of the franchise, Mr. Barbour must construct the distribution system within one year.

He will secure the gas from Iberia and Vermilion parishes, through a pipe line that will connect Bayou, Lafourche, White Castle, Napoleonville, Plaquemine, Port Allen, and Opelousas.

■ ■

Cities Service Plans Line

The Cities Service Gas Co., Bartlesville, Okla., plans to build a 60-mile pipe line from the Cunningham field, Kingman and Pratt Counties, Kan., to Wichita. This 12-in. outlet will give Wichita gas produced within the state.

A.G.A. Laboratories Listing Symbol Trade-Marked

THE United States Patent Office on May 18, 1940, granted application of the American Gas Association for trade-mark registration of its Laboratories Listing Symbol. This emblem is employed for designating gas appliance accessories which comply with applicable American Standard Listing Requirements. The action taken supplements trade-marking, somewhat over a year ago, of the

Laboratories Approval Seal which is employed to designate gas appliances complying with respective American Standard Approval Requirements.

The newly trade-marked Laboratories Listing Symbol incorporates the initial letters of the American Gas Association. This symbol has been available for some time as an alternate or optional marking which could be used if desired in place of the letters "A.G.A." which formed the emblem initially employed.

In order to facilitate trade-marking and to incorporate a more distinctive design, the new symbol was designed and adopted for marking of certified accessories.

■ ■

Canadian Manufacturer Joins CP Range Program

The Gurney Foundry Co., Ltd., of Toronto, Ont., has been granted a license by the Association of Gas Appliance and Equipment Manufacturers to produce CP gas ranges and is now participating in the international sales program being projected in behalf of the CP product, it was announced from the national headquarters of the Association in New York City.

The Gurney Foundry Co., the third Canadian firm to join the program, manufactures heating and cooking appliances as well as commercial enamel products.

■ ■

Union Gas Company, Ltd. Will Serve London, Ont.

W. L. Duffield, vice president of City Gas & Electric Corp., Ltd., Quebec, has announced that the Union Gas Co., Ltd., of Canada, will lay 23 miles of 10-in. transmission line from the new Malahide Field to London, Ont. The project will include a purification plant to be constructed in the field.

■ ■

U.G.I. Executive Passes

Leo A. Sommar, assistant secretary of the United Gas Improvement Co., Philadelphia, Pa., died at his home in Germantown, Pa., at the age of 56. Mr. Sommar started with the United Gas Improvement Co. 38 years ago as an accountant, and was made assistant secretary in 1929.

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Petroleum and Gas Engineer
Design—Construction—Reports
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1936-42 5th Avenue, Pittsburgh, Pa.

ROBERT J. KUHN
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CATHODIC PROTECTION
Transmission Lines — City Networks
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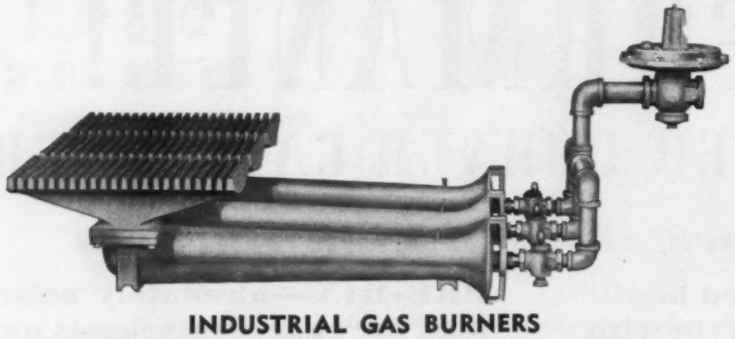

INDUSTRIAL GAS BURNERS
Primarily designed for high pressure vertical type boilers, viz., press machine, vulcanizing, dairy boilers, etc.
P. M. LATTNER MFG. CO. Cedar Rapids, Iowa

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The only publication devoted to the Liquefied Petroleum Gas Industry.
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Atlanta Gas Co. Celebrates Ten Years of Gas Service

THE Atlanta Gas Light Co., Atlanta, Ga., recently observed its 10th anniversary of natural gas service in activities headed "Another Decade of Progress."

During the celebration, it was reported that since the advent of natural gas, the company had extended into 11 new communities and increased its investment of fixed capital from 7½ million dollars to 12½ million dollars.

The following table was prepared by the company to show the various factors in the industry's growth from 1929 to 1939:

Population	115%
Property investment	150%
Mains—3-in. equivalent	140%
Customers	147%
Revenue	180%
Revenue—domestic only	120%
Taxes	300%
M c. f.	600%
B. t. u.—heat units delivered	1050%

In Atlanta itself, one million dollars was spent in converting and augmenting the distribution system for natural gas, and the number of meters increased from 42,878 to 62,894. The number of miles of 3-in. main increased from 934.5 to 1315.

■ ■

Correspondent Compliments A.G.A. Laboratories

In a recent address to the American Management Council, a condensation of which appears in the *Readers Digest* for June, William Hard, Washington correspondent, made the following complimentary references to the gas appliance testing program of the American Gas Association:

> The American Gas Association is a solid old organization, in a venerable business. Its members heard of the consumers' movement, and complaints about unreliable gas appliances. They became very busy. Through the American Standards Association they formed a special committee on gas appliances with consumers among the members.
>
> The Gas Association tested all makes of all gas appliances and has arrived at exacting standards for ranges and water heaters and some 25 other appliances. Ninety per cent of all the gas appliances sold in the United States today are sold under its label. The housewife can buy gas appliances now with assurance of reliability; her own representatives helped work out the standards.

■ ■

New Relief Holder to Be Built in Omaha, Neb.

The Metropolitan Utilities of Omaha, Neb., will soon begin construction of a new 500,000 cu. ft. gas holder to be used for relief purposes, to replace regular holders when the latter are being cleaned or inspected, and to add capacity at any time higher than normal gas reserves are desired. The Stacey Brothers Gas Construction Co. of Cincinnati, Ohio, received the $67,800 contract. The holder will be of water-seal design and is to be completed early this fall.

■ ■

San Diego Utility Requests Authority To Change Name

San Diego (Calif.) Consolidated Gas & Electric Co. has applied to the State Railroad Commission for permission to change its name to the San Diego Gas and Electric Co. It also asked authority to change 150,000 authorized shares of $100 par common stock to 1,500,000 shares of $10 par stock. Only 100,325 shares of the authorized common stock have been issued.

"QUALITY" BUILT THIS PLANT

★ "PACIFIC" is one of the largest plants in the world engaged exclusively in the manufacture of gas heating appliances. In this plant, day and night, hundreds of sheet metal workers, foundrymen, machinists, finishers and expert laboratory technicians busily build for a waiting trade from coast to coast and abroad. For "Pacific" is synonomous with *Highest Quality* . . . gas heating appliances of utmost efficiency, long life, true money's worth. Widespread admiration for "Pacific" products, respect for the company's policy, and the resulting large and steadily increasing volume of business, reflect 27 years of constant, skilful and specialized determination to make always the *Best* gas heating equipment.

The "Pacific" Line is a Complete Line.

PACIFIC GAS RADIATOR COMPANY

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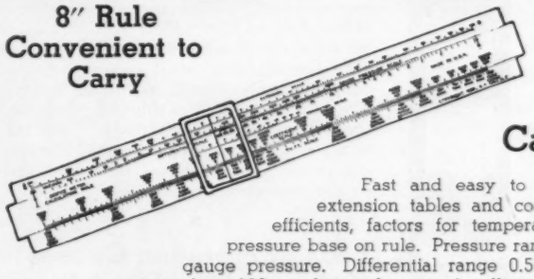
8″ Rule Convenient to Carry



New Orifice Meter Calculating Rule

Fast and easy to operate. Eliminates using extension tables and coefficient tables. Orifice coefficients, factors for temperature, specific gravity and pressure base on rule. Pressure range 25″ vacuum to 1000 lbs. gauge pressure. Differential range 0.5″ to 100″. Will figure gas rates from 100 cu. ft. per hour to 4 million cu. ft. per hour.

Indispensable to metermen and field men for quick calculation of orifice meter rates, also to figure sizes of plates necessary to measure different gas rates. Complete instructions with each rule. Natural wood finish.

Price $2.00 each, postage prepaid.

B. F. GRIZZLE P. O. Box 126 Terre Haute, Indiana

ELIMINATE CONDENSATION TROUBLE

VITROLINER
—the permanent chimney lining that totally eliminates chimney deterioration caused by acid-bearing moisture deposited by all types of fuel. Made of Armco Ingot Iron, vitreous enameled both inside and out.
Also manufacturers of Condensation Eliminator and Howle Heat Extractor. Write for free condensation folder and price list.

CONDENSATION ENGINEERING CORPORATION
2515 Archer Avenue - - Chicago, Illinois

3 rooms or 30

It's the INSIDE *of the* FURNACE THAT COUNTS!

There is a Fraser unit engineered to match the heating needs of every type and size of home.

Whether it is a chill-banishing console, a Tuck-a-Way, or Double Wall heater, a Console Cabinet, or Multiple Outlet Air Conditioning Furnace, the economy of quality materials, scientific design and low operating cost assure customer satisfaction.

IT PAYS TO SELL

FRASER

Heating Comfort

H. R. Basford Co. Distributors San Francisco Los Angeles

Fraser Furnace Co. Manufacturers Stockton California

FRASER
GAS HEATING EQUIPMENT

Winners of Student Contest Announced by Servel

THE nation-wide Urban Foods Project-Contest sponsored by Servel, Inc., Evansville, Ind., for the city youth of the nation, brought awards to 40 state winners and their sponsoring teachers, and a trip to Washington, D.C., and New York for Jane Crampton, 17, of Meridian High School, Meridian, Miss., the national winner in the project.

Bruce Barton of New York, United States Representative, editor and writer, headed the panel of home economists and home economics educators, who judged the contest, in which more than 8000 urban high school students from 40 states in the Union took part. Five hundred home economics teachers supervised the contest, which covered class and home work, as well as field work, in the purchasing, preparation and preservation of food, with emphasis on the adequate protection of food through modern refrigeration. The contest was designed primarily to give young people in the nation's cities an opportunity to acquire skill in the tasks they will be called upon to do in the future as heads of the home.

The judges in the project-contest, in addition to Bruce Barton and Jane Tiffany Wagner, director of Servel's home economics department, were:

Joan Rock, of Pratt Institute; Elizabeth Sweeney, Syracuse University; Frances L. Swain, Chicago Public Schools; Rosalind Mentzer, Dowagiac (Mich.) High School; Jessie McQueen, A.G.A.; Karen Fladoes, Peoples' Gas Light & Coke Co.; Eleanor Howe and W. S. Harvey, Jr., co-editors of *The Student Home Economist.*

■ ■

Massachusetts Gas Company Purchased for One Dollar

The Securities and Exchange Commission permitted Harold E. Greenwood, a state forester of Gardner, Mass., to purchase the Gardner Gas, Fuel and Light Co., last March 15, for $1. SEC officials could not recall a cheaper sale of a "going concern" gas company. The company's indebtedness to the Massachusetts Utilities Associates will be cancelled under the terms of the sale. Mr. Greenwood declared he planned to sell "bottled gas" to communities located in rural sections around Gardner, and plans to operate the company with the assistance of his family, as a means of livelihood.

■ ■

Kansas City Co. Advertises Home Service Department

A full-page advertisement listing the services rendered by the home service department of the Kansas City (Mo.) Gas Co. appeared in a recent Sunday edition of the *Kansas City Journal.* Individual pictures of the department were placed in the advertisement. The company stated in the advertisement that the services of the department were offered to all homemakers, regardless of whether gas equipment was purchased from the company or gas appliance dealers.

■ ■

Lack of Proration Causes Oklahoma Field Development

Extensive development of the southern or Oklahoma section of the huge Hugoton gas field, in Texas County, has been reported. This is largely due, it is believed, to the absence of restrictive proration of natural gas production in Oklahoma.

Republic Natural Gas Co. has purchased an additional 40,000 acres of leases in this sector and a wide drilling campaign is expected to start soon to meet requirements for transportation of gas to northern and middle-western markets.

The only gas proration in Oklahoma is the statutory restriction to 25% of potential capacity of the well, intended to prevent waste in state gas fields.

Several new gas wells promising new gas zones, or extensions of present fields, were completed in Oklahoma during April.

Charles Bentrup, Deerfield, Kan., opened a new gas zone south of Talala, Rogers County, with a well tested at 850,000 cu. ft. daily, 560 lbs. pressure; Claude W. Garrett announced the discovery of a 20,000,000 cu. ft. gas well in Muskogee County, three miles north of the McIntosh County line; and Pure Oil Co. brought in a well in the Denison Dam area, Marshall County, which in the last hour of a 14½-hour test was flowing 25,000,000 cu. ft. of gas.

■ ■

W. H. Berg, Standard Oil President, Succumbs

William H. Berg, president of the Standard Oil Co. of California, died June 26 at the age of 58. He recently suffered a heart attack and had been confined to his home in Hillsborough, Calif.

Mr. Berg's whole business life had been devoted to the Standard Oil Co., which he joined in 1902 as stenographer. During his 38 years of service he rose to leadership of the firm, becoming president in 1937 after the death of the late K. R. Kingsbury.

Mr. Berg came to California from Iowa in 1902. He was elected vice president in 1927. For a number of years he served as director of the American Petroleum Institute. He was also a director of the Golden Gate International Exposition, and a director of the California Oil and Gas Association.

■ ■

W. A. Townsend, Central Illinois Company, Dies

W. A. Townsend, advertising manager of the Central Illinois Light Co., Peoria, Ill., passed away June 1 after a two weeks' illness. He was graduated from the City of London College, London, England, and in 1916 became associated with the old Springfield Gas and Electric Co. (now the Springfield Division of the Central Illinois Light Co.) as advertising manager, which position he held at the time of his death.

■ ■

New Submarine Line To Supply New Orleans

The United Gas Pipe Line Co., Houston, Texas, has announced completion of a multiple submarine pipe line across the Mississippi River to augment facilities for supplying natural gas to the New Orleans area.

The line crosses the river near St. Rose, La., where the river is about 100 ft. deep and 3000 ft. wide. The line connects the Lirette, Lake Long and other fields in South Louisiana with its Baton Rouge-New Orleans line.

■ ■

Springfield Gas Man Dies

George Whysall, pipe line constructor of the former Springfield (Ohio) Gas Co., died recently at the age of 78.

In 1899 he constructed a 34-mile network of pipe lines throughout the city of Springfield in 81 days, which was considered a record at that time.

★ In Times of Industrial Speed-up! ★

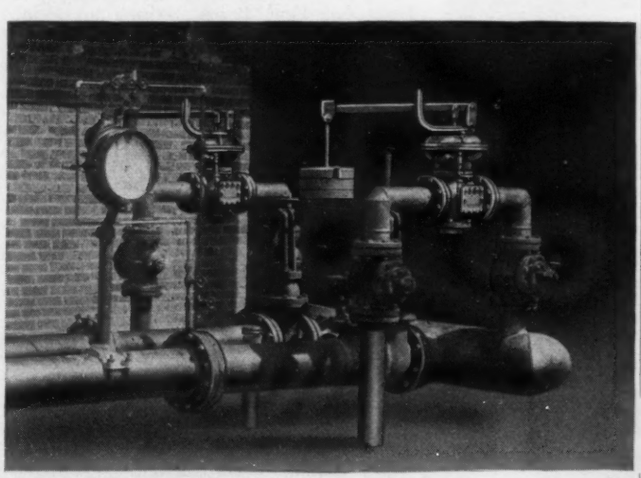
★ ★ ★ ★ ★ ★ ★

Today the watchword is preparedness and National Defense. Every industry is striving to do its part in making America safe for Americans. In Industrial Gas Control there are unusual demands in heat treating of metals that call for extreme accuracy in Gas Control.

REYNOLDS offers greater Capacity—Increased Range—Quicker Response—all features of REYNOLDS Gas Regulators for Industrial Control. They assure smooth, constant outlet pressure and volume. Manufactured in single or double valve construction, REYNOLDS Industrial Regulators are proved by performance in factory tests and on installations throughout the world.

REYNOLDS Cooperation in solving Gas Control Problems is always available. Write.

★ *Gas Control Since 1892* ★



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ANDERSON, INDIANA, U. S. A.

GAS CONTROL

AT ANY POINT IN THE LINE

Reliance CBV Regulators are used for controlling pressure in distribution mains, industrial services, transmission lines and gas gathering systems.

Reliance CBV Regulators in the offset connected series are fitted with hand holes that provide easy accessibility to valves without removing the Regulator from the line.

Reliance Type HPH Regulators are recommended for small industrial installations where sensitive control and positive lock-up are required.

Reliance Type HPR Regulators are for high pressure installations. Inlet pressures up to 1000 pounds are safely handled with outlet pressures ranging from 2½ to 200 pounds.

Reliance Type H and K Regulators are recommended for domestic and industrial service. Spring or weight loaded models can be furnished with mercury seal, internal mechanical relief valve or automatic shut-off valve as desired.

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RELIANCE REGULATORS
RELIANCE REGULATOR CORPORATION
1000 MERIDIAN AVENUE, ALHAMBRA, CALIFORNIA

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***Automatic* GAS HEAT**
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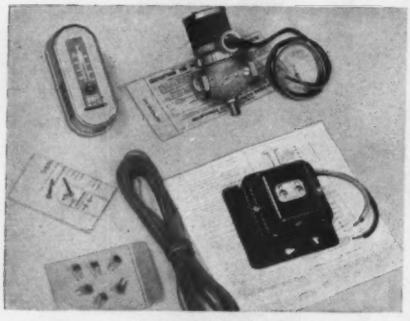

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Quiet in Operation
MODEL 200 THERMASTER
Snap-Acting Heat-Anticipating Room Thermostat
TRANSFORMER, WIRE, FITTINGS

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Send for full information. Complete line of valves and thermostats meets practically all requirements.

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807 Forest Street Attleboro, Mass.

SEMET-SOLVAY ENGINEERING CORPORATION

•

Blue Gas Plants — Gas Purifiers
Water Gas Machines — Condensers
Washer Coolers — Waste Heat Boilers
Naphthalene Scrubbers — Producer Gas Plants

40 RECTOR STREET, NEW YORK, N. Y.

Wisconsin Utility Effects Wages-Hours Agreement

THE first "stabilization of employment" agreement in the utility business and one of the first half-dozen by any industry is reported by Wisconsin Public Service Corp. officials at Green Bay to have been honored by the Federal Wage and Hour Administration. In effect a guaranteed wage and hour agreement, it was recently signed by Public Service officials and International Union of Operating Engineers (AFL) representatives. It is effective for a year and is retroactive to April 1, 1940.

The plan guarantees to permanent employes a minimum year's earnings, states the total number hours of work, and is said by union people to be the first ever signed by any American Federation of Labor affiliate.

Consideration is also given in the plan to maximum daily and weekly hours of work, with overtime provisions when special conditions require more than 12 hours of work a day or 56 hours a week.

Company employes will also receive the usual sick leave benefits, two weeks vacation with pay, group insurance, holidays (except shift employes) and other personnel details previously in effect.

■ ■

S.C.M.A. Elects Officers At Annual Meeting

New officers of the Southern California Meter Association were elected at the fourth annual Low-Jinks meeting held June 27 at Downey, Calif.

The men elected are: M. J. Cereghino, Southern California Gas Co., president; W. W. Williams, O. C. Field Gasoline Corp., Huntington Beach, vice president; Gordon S. Duncan, General Petroleum Corp., Santa Fe Springs, secretary, and R. A. Keams, Union Oil Co., Los Angeles, treasurer.

Elected to the board of directors were: P. W. Hill, General Petroleum Corp., Los Angeles; Anatole Fomilyant, Merco Nordstrom Valve Co., Los Angeles; George Bruno, Southern Counties Gas Co., Los Angeles; W. L. Cowan, Union Oil Co., Santa Fe Springs; George Stevenson, Pacific Meter Works, Los Angeles; Oliver Muff, Commercial Iron Works; George H. Forster, The Texas Co., Long Beach, retiring president. H. A. Faull, Southern Counties Gas Co., and a former president of the Association, was chairman of the nominating committee.

■ ■

Natural Gas Film Shown

The El Paso (Texas) Natural Gas Co. recently presented a 30-minute moving picture in sound and color, entitled "Natural Gas on the Desert" to various clubs in Silver City, N. M. The picture shows the entire operations of the pipe line company in bringing natural gas to the cities, drilling of the wells, treating of the natural gas and means by which a constant pressure is maintained in the pipe line.

■ ■

Gas Man Seeks Position

Ray Krouse, 6736 Chestnut St., Mariemont,, Cincinnati, Ohio, is seeking a position with a gas company. He states he is 37 years of age, married, has had high school education, two years night college training, and six years gas experience. He was construction superintendent his last place of employment; has A-1 references, and prefers service department work.

A.G.A. Announces National Advertising Schedule

THE A. G. A. program of national cooperative advertising for the fifth year starting July 1, 1940, has been completed in most of its details by the Committee on National Advertising, of which Major T. J. Strickler of Kansas City is chairman, and the Association's executive board has formally approved the campaign.

Four-color insertions will again be used, these appearing in national magazines having a circulation in excess of 19,000,000 copies. The consumer advertising for the new year will consist of two series, one devoted to gas for cooking, the other to all four major domestic uses of gas. The campaign will be further rounded out to include a program of industrial and commercial gas advertising to appear in key trade papers. Publicity and sales promotion activities will continue as heretofore.

The initial advertisements of the new series are scheduled for first appearances in September national magazines. McCann-Erickson, Inc., New York, works with the Committee on National Advertising in the preparation of the campaign on gas cooking and the four major domestic uses of gas, while Ketchum, MacLeod & Grove, Inc., of Pittsburgh, works with the Advertising Committee of the Association's Industrial Gas Section in the preparation and placing of the campaign for industrial and commercial gas.

■ ■

John Zink Co. Announces Appointment of Agents

The John Zink Co., Tulsa, Okla., manufacturers of industrial burners, conversion furnace burners and floor furnaces, has recently appointed the following agents: J. A. Moore, New York, N. Y.; J. W. Blemker, Cincinnati, Ohio; J. F. Mulkey, Detroit, Mich.; A. J. Foley, Chicago, Ill.; J. A. Morgan, Houston, Texas; Elmo Hall, Denver, Colo.; George Garland, Salina, Kan.; D. J. Shrimpton, Los Angeles, Calif.; E. B. Morrill, San Francisco, Calif.; John A. Dodd, Atlanta, Ga.; F. S. Lapeyre, Murray-Baker-Frederic Co., of New Orleans, La., and Harris Frederic, Murray-Baker-Frederic Co., Shreveport, La.

■ ■

Committee Named To Select P.C.G.A. Officers for 1941

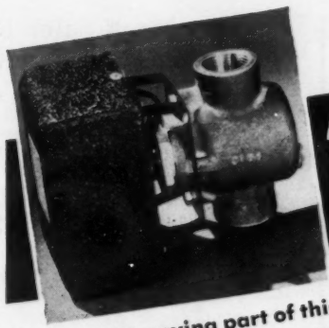
A. E. Holloway, president of the Pacific Coast Gas Association, has appointed the following association members as a nominating committee to select the Association officers for 1941: N. R. McKee, Los Angeles, chairman; E. H. Coe, Phoenix, Ariz.; E. L. Hall, Portland, Ore.; Walter H. Davis, Oakland, Calif; Hal Singleton, Los Angeles, Calif.

The nominating committee will make its report at the annual meeting of the Association to be held at Coronado in September.

■ ■

George Hammer, California Manufacturer, Dies

George Hammer, president of the Hammer-Bray Co., manufacturers of gas ranges and circulating heaters, died at his home in Piedmont, Calif., June 13. Mr. Hammer has long been prominent in the Pacific Coast gas industry and has served as a director of the Pacific Coast Gas Association and as chairman of the Gas Range Division of the Association's Manufacturers Section.



ALL ELECTRIC LOW WATER CUTOUT

The only moving part of this Cutout is the armature and mercury tube. Nothing to wear out or fail to function. Small volume electrode chambers minimize settling of suspended particles and mudding up. Dual voltage coils permit either 115 or 230 volt A.C. connections on the job. Low electrode voltage. Electrode insulators guaranteed to withstand action of steam and water under pressure. Adaptable to all units for low water cutout service, at pressures up to 150 pounds and temperatures to 366° F. Other models for various mountings are described in new 1940 catalog, free on request.

FOR COAL, OIL OR GAS-FIRED BOILERS

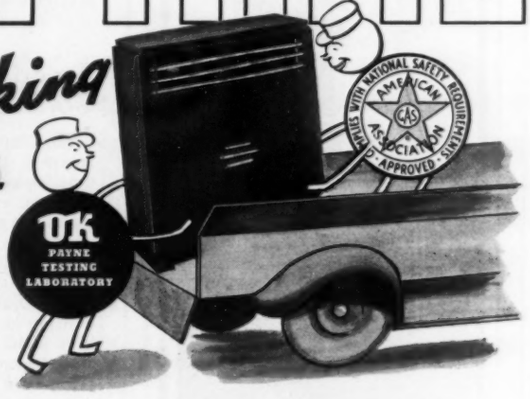
GENERAL CONTROLS

405 EAST OHIO STREET CHICAGO, ILL.

267 5TH AVENUE NEW YORK CITY

FOR HIRE

Two Hard-Working Partners



Prominently displayed on every *PAYNE* Furnace, these two partners — the "Blue Star" Seal and the Payne Testing Laboratory Tag — will help you make more sales. Together, they testify that all *PAYNE* equipment has met the Industry's *top* requirements for design, safety, and performance . . . in *two* of the nation's outstanding proving grounds. ☆ Sales-minded utility men . . . you can build your load steadily and permanently with the *PAYNE* line-up of fully vented, efficient heating equipment.

Floor Furnaces—Forced Air Units—Duplex Furnaces—Gravity Furnaces—Console Heaters . . . a PAYNE gas appliance for every heating need.
☆ Utility Men—a few territories still open. Write us.

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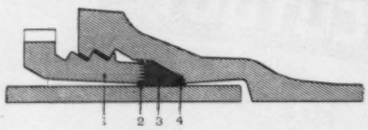
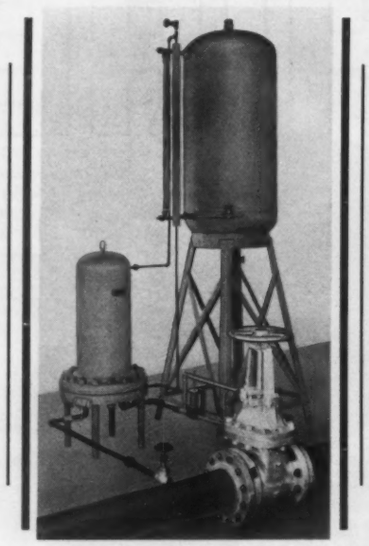
MONO-CAST CENTRIFUGAL
Screw-gland Pipe



(1) Cast Iron Screw Gland. (2) Fabric Face on gasket. (3) Rubber gasket. (4) Lead ring.

MONO-CAST Centrifugal Screw-Gland Pipe is an all-purpose, economical, mechanical joint pipe suitable for water, gas, oil and other fluids. It is cast centrifugally in sand-lined refractory molds to possess the recognized superior strength properties inherent to all Mono-Cast Pipe, and is equipped with the Screw-Gland Joint which is identical in basic principle to the well-known Doublex Simplex Joint except that the gasket is compressed by a screwed gland instead of by bolts. Furnished in sizes 3" to 12" inclusive, with a full line of fittings. Write for detailed literature.

AMERICAN
CAST IRON PIPE CO.
BIRMINGHAM, ALA.
Dallas Houston El Paso Pittsburgh Chicago
Kansas City Minneapolis New York City
Cleveland Los Angeles San Francisco



PEERLESS TYPE M-500#
ODORIZER

Accurate odorizing regardless of Temperature and Pressure Variations. Meter operated for Economy and Accuracy. New Pressure Compensator. Write

PEERLESS MFG. CO.
113 Murray Street Dallas, Texas

Carbon Black Sales Reach Record Levels in 1939

THE carbon black industry reached new peaks of production and consumption in 1939, due to the demands of the warring nations and to the recovery, in rubber production, according to the Bureau of Mines, U. S. Department of the Interior, in their Mineral Market Reports, M. M. S. No. 841, released June 14.

Production was 525,166,000 lbs., 10% more than in 1938; total sales were 560,533,000 lbs., an increase of 36% over 1938. Exports of carbon black passed the 200,000,000-lb. mark for the first time; domestic sales increased 47% over those in 1938 and were 14% above the previous peak recorded in 1936.

Two new plants were added to the operating list; eight were dismantled or shut down, making a total of 49 operated during the year compared with 55 in 1938.

There were 347,270 million cu. ft. of gas burned in the manufacture of carbon black in 1939, compared with 324,950 million in 1938. The average yield per 1000 cu. ft. rose from 1.47 lbs. in 1938 to 1.51 lbs. in 1939. The average value of natural gas used was 0.94 cent per 1000 cu. ft. in 1939 compared with 0.89 cent in 1938.

■ ■

Oldest Known Pipe Line Uncovered In Egypt

Ruins of what was probably the oldest pipe line of which civilization has record were found in an excavated temple at Absuir in Egypt a few years ago. Archeologists estimate that the line was fabricated around 2750 B.C.

The pipes, which evidently were used for conducting water, were 1.8-in. and were made of hammered copper in 3-ft. lengths. The seams were unsoldered and were formed by overlaps which had been closed by hammering. To make the line water-tight, the pipes were covered with a cement made of gypsum before being placed in stone conduits. The project required about 1300 ft. of pipe.

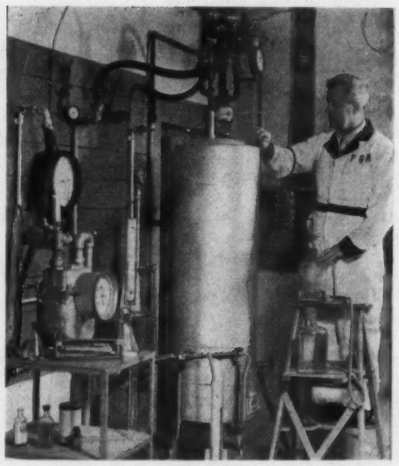
■ ■

American Recording Chart Co. Builds Large New Plant

The American Recording Chart Co., Los Angeles, Calif., is planning to construct a new plant at 3113 East Eleventh Street, it has been announced recently by James Dunn, manager. (See cut below.)

The new plant will have a large laboratory, and will be completely air conditioned with gas-fired equipment.

In addition to the production of Arco recording charts, the company distributes Macnick chart clocks, meters, indicators, gas and liquid gravitometers, and other measurement equipment.



An engineer checking new appliances in Pacific Gas Radiator Co.'s new enlarged laboratory in Los Angeles.

Pacific Gas Radiator Co. Builds Los Angeles Plant

The Pacific Gas Radiator Co., for 27 years a manufacturer of gas heating equipment, has recently completed a new plant at Los Angeles. The new building is air-cooled, and contains offices for executives and personnel, show rooms, printing plant, a research laboratory, and a department for promotion activities.

In addition to gas radiators and floor furnaces, the company manufactures forced air control heating plants, evaporating coolers and hot water heaters.

■ ■

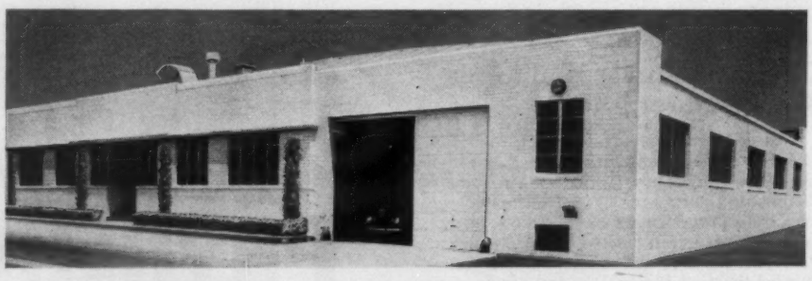
Looping Program Planned By Memphis Natural Gas Co.

The Memphis (Tenn.) Natural Gas Co. is increasing the capacity of its main 18-in. trunk line from Monroe, La., by a looping program which will put 92 miles of 18-in. pipe at strategic sections of the system. The contract for the construction work has been awarded to N. A. Saigh Construction Co., San Antonio, Texas.

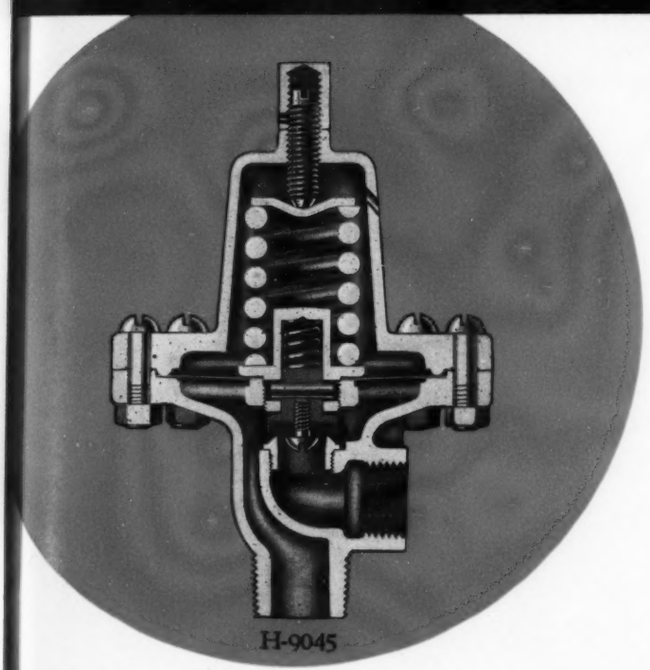
■ ■

Mrs. Robert Hately, Home Economist, Succumbs

Mrs. Robert Hately, known in the gas industry as Jessie Read, director of the home service department of the Consumer's Gas Co., Toronto, Ontario, died recently at the age of 35. She was a member of the home service committee of the American Gas Association, and conducted a food column in a Toronto paper.



New Pacific Coast home of the American Recording Chart Co., Los Angeles



There are many different styles and types of Mueller Relief Valves to suit every purpose and all of them have the exclusive Auxiliary Spring Seating Principle. Write Mueller Co., Decatur, Illinois, Dept. G. A. for full information.

Here is real Accuracy!

The accuracy with which Mueller Relief Valves respond to excessive pressures is due to their exclusive Auxiliary Spring Seating Principle and their large Monel Metal Diaphragms. The large diaphragm area permits the pressure to build up a multiple load assuring positive opening at the predetermined setting. The light auxiliary spring forces the seat disc firmly to the seat closing off the valve securely without using extreme pressure. This construction permits using a disc of softer composition that seats lightly and is not imbedded or grooved into the valve seat and is therefore very sensitive to slight variations in pressure when dangerous limits are approached. Repeated tests show Mueller Relief Valves open instantly and close tightly within 5% of the pressure at which they are set.

MUELLER RELIEF VALVES

Simplicity of construction.

Parts interchangeable.

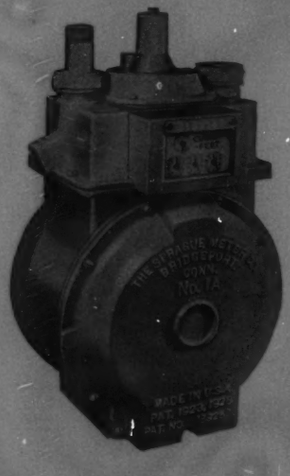
Reduced operating costs.

Accuracy in registration.

Gives satisfactory service.

Uniform performance.

Efficient and dependable in manufactured, natural and Butane Gases.



THE SPRAGUE METER CO. BRIDGEPORT, CONN.